# Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME X.] NEW-YORK SEPTEMBER 30, 1854. [NUMBER 3.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At 128 Fulton Street, N. Y. (Sun Buildings,)
BY MUNN & COMPANY.

O. D. MUNN, S. H. WALES, A. E. BEACH.

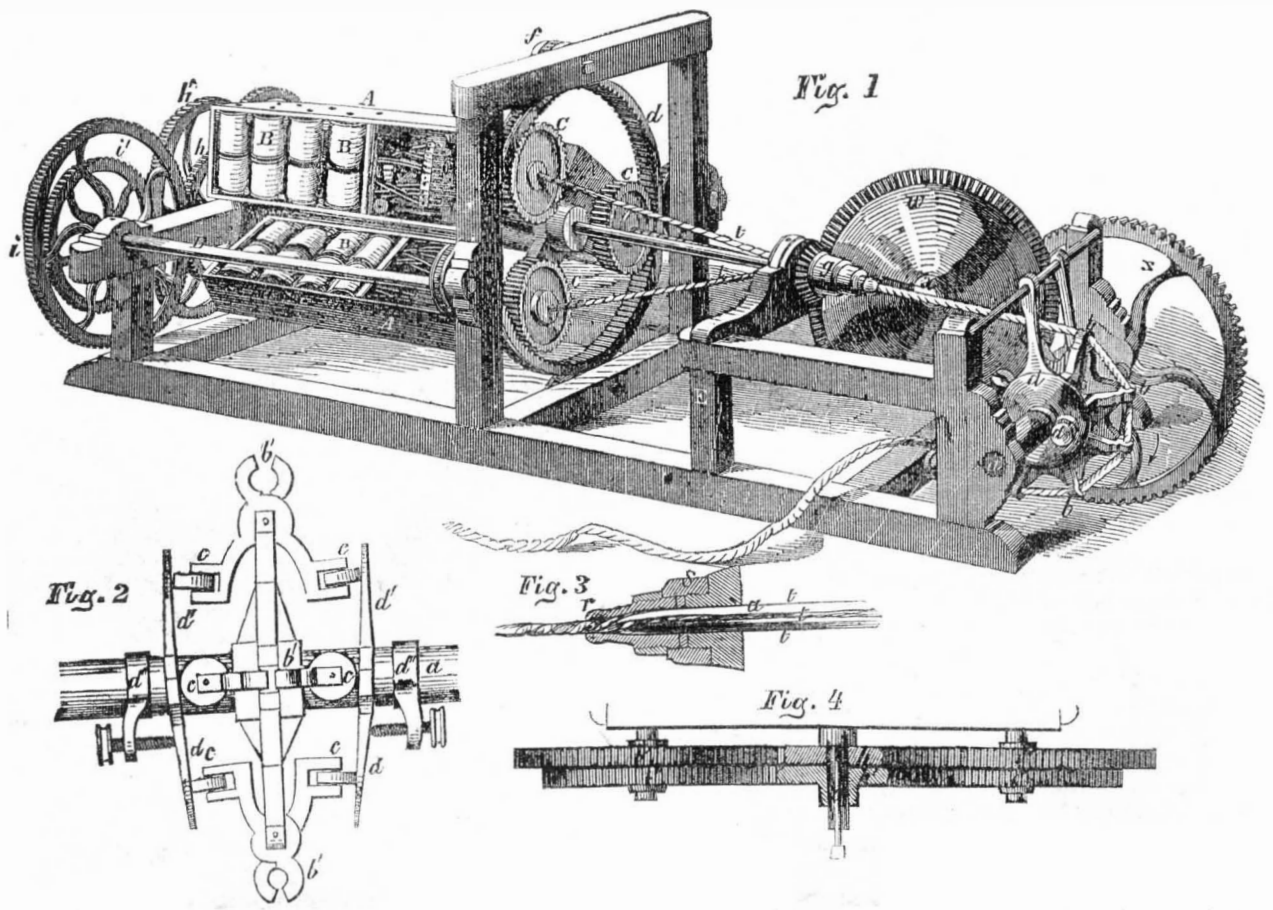
Agents.

H. Taylor, Baltimore, Md.
Federhen & Co., Boston.
Stokes & Bro., Philadelphia.
Le Count & Strong, San Fran
S. G. Courtenay, Charleston.
Avery Bellford & Co., London.
Dexter & Bro., New York.
B. Dawson, Montreal, C. E.
M. Boullemet, Mobile, Ala.
E. W. Wiley, New Orleans.
E. G. Fuller, Halifax, N. S.
M. M. Gardissal & Co., Paris.
S. W. Pease, Cincinnati, O.

Responsible Agents may also be found in all the principal cities and towns in the United States.

TERMS—$2 a-year :—$1 in advance and the remainder in six months.


## IMPROVED ROPE MAKING MACHINE.




### Rope Machine.

The annexed engravings are views of a machine for which a patent was granted to William Robinson, Jr., of Warsaw, N. Y., on the 2nd of last May.

Figure 1 is a perspective view ; figure 2 is a plan view of the delivery machinery ; figure 3 is a longitudinal section of the laying socket, &c., and figure 4 is a cross plan view of the adjustable driving gearing. Similar letters refer to like parts.

The invention consists of two parts, viz. : the employment of a ring with cogs on both its inner and outer edges, said ring being revolved by pinions meshing into the exterior cogs, for the purpose of regulating the relative twist of the separate strands and the entire rope, by diminishing to a greater or less extent the number of revolutions of the flyers upon their axes while performing a single revolution about the main axis ; also an arrangement of clamps, figure 2, for receiving the finishing rope, and holding it firmly during the laying operation, and then finally conveying it from the machine as shown in figure 1.

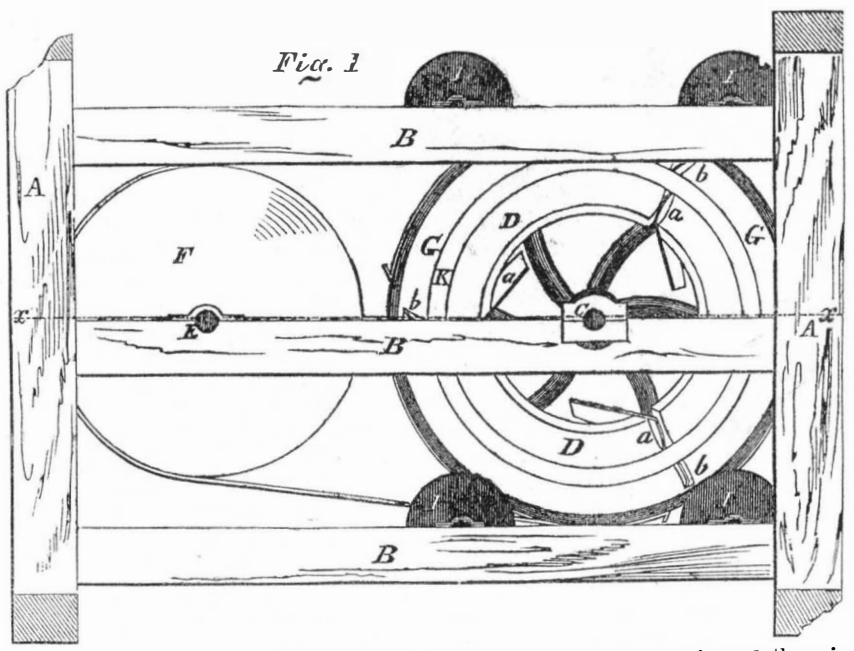
*a* is the shaft to which the power is applied for driving the machine ; to this are fastened tri-branched bearings, each supporting a flyer, A. These flyers are boxes containing the spools, B, with the yarn on them ; and also the guide rollers ; the number of spools is regulated by the size of rope required ; C C C are pinions on the inner extremities of the flyers ; these mesh into the cogs on the inside of the ring, *d*. The outer cogs of this ring mesh into the pinions at each side, and one, *f*, at top, and a like one at the bottom of the frame, thus being supported at the four quarters. The shaft, *a*, has on its outer extremity cog wheels, *h h'*, which mesh into wheels, *i i'*, on shafts, D.

At the inner end where the driving shaft is supported on the small frame, E, it is there enlarged so as to contain channels for the passage of the twisted yarns to the laying piece, *r*, (figure 3) which fits into a socket, *s*, the size of the bore of which is regulated by that of the rope. The socket, *s*, screws upon the head of the shaft, *a*, upon which between the outlets for the yarn is a point around which the lay of the rope is made. Upon the end of the shaft, *a*, there is also a bevel pinion behind the collar, *g*, which gears with the wheel, *x*, which has a stub shaft on the frame with a pinion on it gearing into the wheel, *z*, which drives the clamping and delivery part of the machine, figure 2. It will be observed that the different yarns of the bobbins in each fly frame are crossed and pass around the inner rollers, so that as the flyes revolve they are twisted into three strands, *t t t*, which are guided and passed through eyes in the center of the pinions, C C C, and then converge and pass through the socket, *s*, and are twisted into a rope at the laying piece, *r*, and is held fast and delivered by the revolving clamping jaws, *b b b b*. This clamping and delivery part of the machine s peculiarly constructed ; on a cross shaft, *a'*, are secured a set of clamps which have jaws that open and close like a blacksmith's tongs, and are formed so as to have a round opening to hold the rope. The inner ends of these jaws have shoulders in which are fitted small friction rollers, *c c*, figure 2. On the same shaft, *a'*, are secured disks suspended to a cross bar above, and set by the screws on collars, *d'' d''*. It will be observed that as the clamps, *b' b'*, revolve, they are closed when the wheels, *c c*, are compressed between the narrowest part of the disks or cam plates at *d d*, and there they hold the rope firmly ; and again when they are at a point to deliver the rope, they are open because the clamp wheels, *c c*, are not compressed by the wide parts of the disk plates, *d' d'*. The jaws of the clamps have a tendency to spring open by springs attached to them for that purpose. The jaws, *b'*, are thrown open at the under part of the revolving clamps just before they rise to receive the rope from the laying piece. These revolving clamps hold the rope during the laying action, and deliver it from the machine as shown in figure 1.

The flyers have each an independent motion around its own axis opposite to the revolution of the main axis of shaft, *a*. This independent motion is given by the meshing of the cog wheels, C C C, in the inside of ring *d* ; this gives the twist to the strands, *t t t*, and the revolution of the flyers round the main shaft, *a*, causes the laying of the rope. By the revolution of the shafts, D, the pinions on their inner ends, by gearing into the cogs on the outside of ring *d*, rotates it with a velocity depending on the following causes : The wheels, *h* and *h'*, are so arranged on the driving shaft, *a*, that but one at a time is revolved on it—the other being then loose, consequently if the wheel, *h*, be revolved on the shaft, the wheels, *i i*, will revolve the shafts, D D, with a less velocity than if geared with the wheel, *h'*, and wheels, *i' i'*. The revolution of the flyers, A, about the shaft, *a*, performs the laying of the rope ; their rotation about their axes in the opposite direction to *a*, gives the requisite twist to the several strands, the amount of which twist depends on the number of rotations of their own axis to a single revolution about the main axis. The number of revolutions of the flyers to that of the main axis depends on the distance passed over on the inner cogs of ring, *d*, by pinions, C C C. The faster the ring, *d*, is made to revolve, therefore, the fewer will be the number of cogs with which the pinions can mesh with during a single revolution of the flyers round the main shaft, *a*. The twist, therefore, to be given to the strands is regulated by the motion of the ring, *d* ; if at rest the strands will have the greatest twist, (for which arrangement is made) and if run at its highest velocity, of course the strands will have the least twist. This machine is ingeniously constructed for regulating the twist ; it is simple in construction, and makes beautiful rope. The cut, figure 1, is taken from a working machine which we have seen in operation, and respecting which and the rope, (cotton rope) made by it, we have a very high opinion. This machine will be exhibited at the New York State Fair, which is to be held in this city in the first week of next month.

More information may be obtained by letter addressed to the patentee at Warsaw, N. Y.

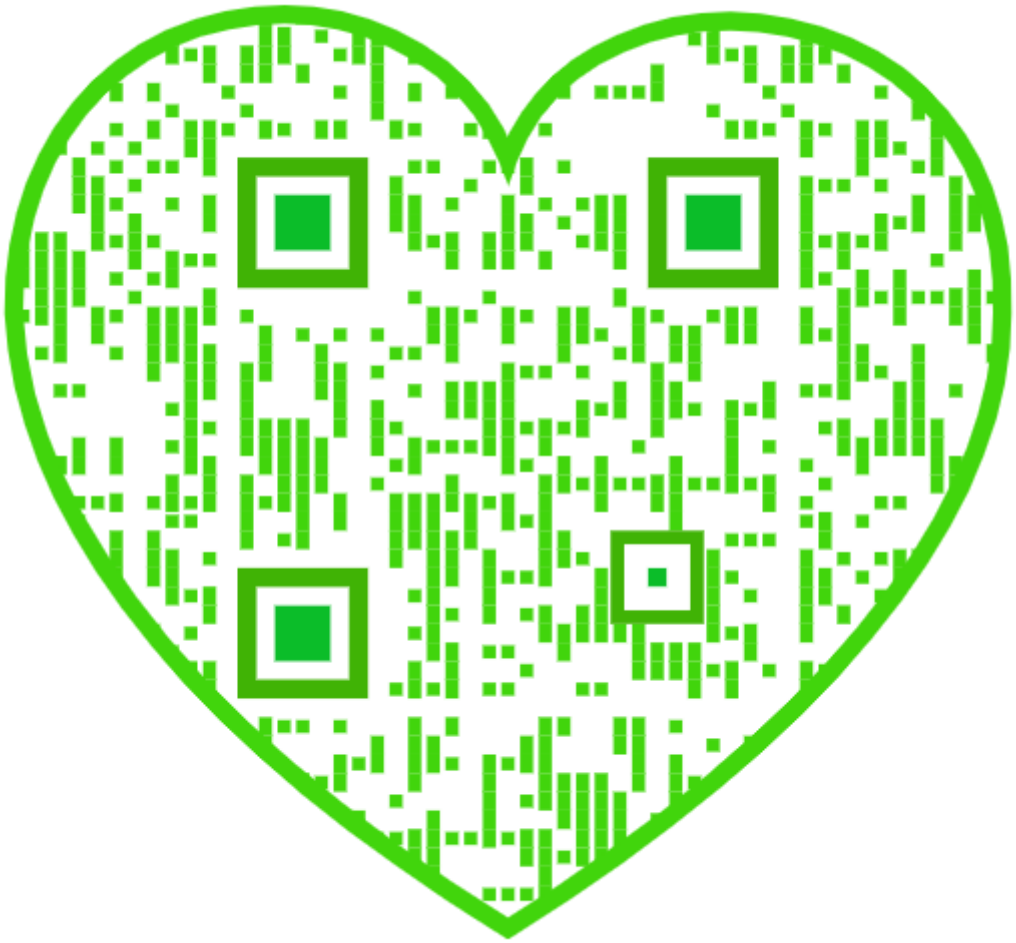
## HOBSON'S STAVE DRESSING MACHINE.




The annexed engravings are views of an improvement in Stave Machines, for which a patent was granted to Carmi Hobson, of Hannibal, Marion Co., Mo., on the 30th of May last.

The nature of the invention consists in the combination of the rim and wheel, both provided withsuitable cutters, and concentrically arranged about the same axis, and these in combination with a fixed rest, so that by passing the stave through between the inner periphery of the rim, and the outer periphery of the wheel, both running in the same direction, the stave shall be dressed on both sides by a simultaneous operation, and without the use of auxiliary guides, yielding rollers, or other

© 1854 SCIENTIFIC AMERICAN, INC.



appliances than the said rim, wheel, and rest.

A represents the upright, and B the horizontal timbers of the frame. The power to drive the machine may be communicated from any first mover, through the shaft, C, which is supported in proper bearings in the longitudinal pieces, B, and upon which said shaft is placed the cutting wheel, D, provided with any convenient number of knives, *a a a*, the particular shape of the cutting edges of which knives is more distinctly seen at *a*, figure 2, and are for dressing the inside of the staves.

Another shaft, E, parallel with that, C, is placed on the horizontal timbers, B, which shaft may receive its motion from the shaft, C, by means of pulleys and a belt; on this shaft, E, is placed a pulley, F, around which and the rim, G, pass an endless belt, H, for the purpose of communicating motion to said rim, it running in the same direction and at about the same velocity with the wheel, D. The rim, G, has no center to turn upon, but is supported in place by four friction rollers or pulleys, I I I I, on each side of it, there being a suitable slight recess cut on each edge of the periphery to cause it to run true on said pulleys. The rim, G, is also provided with a convenient number of knives, *b*, for dressing the outside of the staves, the particular form of which may be more distinctly seen at *b*, in figure 2. J, in figure 2, represents the fixed rest upon which the stave is slid through between the wheel and rim. This rest is secured to the horizontal timbers, B B, and holds the stave whilst it is being acted upon by both the sets of cutters in the rim and wheel. In figure 1, K represents the space between the wheel and rim through which the stave is forced by the hand as far as convenient, the next stave pushing it clear through; and different sized staves are dressed in the same machine by throwing the wheel towards or from the rim at the point where the staves are fed in, and for this purpose the wheel and rim must be adjustable in relation to each other. By reference to figure 2, it will be perceived that however thick or winding the stave may be, the curve of the cutters will catch it gradually, whilst by the large opening into which it is at first fed, it may be turned to one side or the other, as the stave may wind to one side or the other. The stave cannot pass through any faster than the excess of material is cut off from the stave by the cutters. The cutters terminate at *c c*, figure 2, and beyond that point; the inner periphery of the rim, G, and the outer periphery of the wheel, D, serve as guides to hold up and steady the stave so that it may be evenly operated upon on both sides. The stave is fed through between the rim and wheel, parallel with their shafts, as nearly as the natural shape of the stave will admit. By the simple

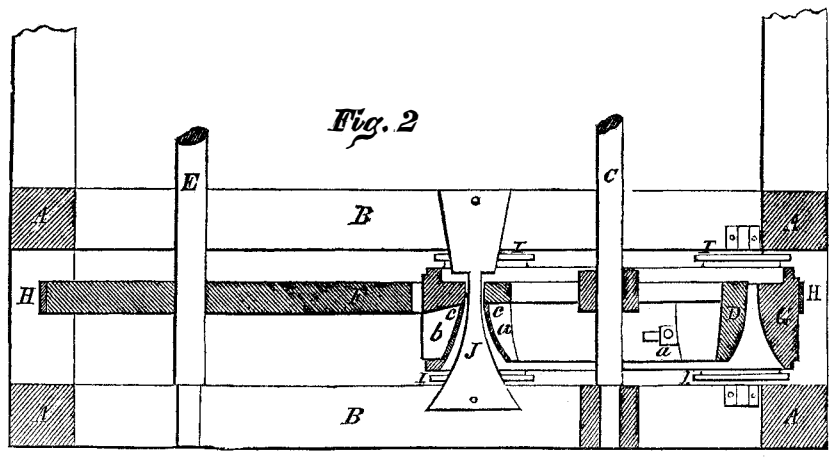


Fig. 2

wheel, rim, and rest, the inventor says, "I make a perfect and rapidly operating machine which has all the elements necessary for feeding in, resisting the action of the cutters, and guiding and controlling the stave in its passage through the machine, and dispensing with many of the separate appliances for accomplishing this purpose." The claim for this machine is "the combination of the cutting rim and wheel hung in the same vertical plane, with the fixed rest passing between their cutting surfaces." More information may be obtained by letter addressed to Mr. Hobson at his place of residence.

### The Telegraph.

The last number of the London *Quarterly* contains an article on the Electric Telegraph from which we have gleaned not a few interesting items of intelligence. The author of it discusses the question of priority, respecting the invention of the first practical telegraph, and awards three wreaths to as many separate inventors, namely, Steinheil of Germany, Morse of America, and Wheatstone of England. This accords with our own views of the question. From the evidence which we have examined, it appears to us that these three (all professors) invented their separate telegraphs, unknown to one each other, and they are so different in their construction and operation, that each must be considered a distinct invention. Prof. Morse himself, in the work of Alfred Vail, proclaims his telegraph to be entirely different from that of any of the European savans. Both the German and English inventors had the advantage of Prof. Morse, in having working lines in operation for some years before him. —Steinheil and Wheatstone had lines of telegraph in operation in July, 1837, at which time Prof. Morse's telegraph was in a comparatively crude and experimental state, in the New York University; and it was not until 1844 that it was put in public operation by the construction of the government line between Washington and Baltimore. The principle upon which his telegraph is constructed, and the improvements which he has made in it since then, places it far in advance of his European cotemporaries now. The idea of employing electricity to convey messages (an electric telegraph) is old and does not belong to any of the successful electric telegraph inventors of the present day.

As far as we can learn, the recording telegraph of Prof. Morse is the one in most common use on the continent of Europe, as it is in our own country. In England, the old visual telegraph of Prof. Wheatstone is the one in most common use. In 1853, there were 24,340 miles of telegraph wire in operation in that country—but a few hundred miles less than the length of the American wires as given on page 154 of Dr. Turnbull's work. The telegraph in America is more democratic than in any other country but one; none but the comparative wealthy can use it in England, as the charges for messages are five times higher than in America. In France it is merely a government engine, and is not much better in all the other European kingdoms. It is very different in the Swiss Republic, however; there it is the engine and the creature of the people. It was erected by their voluntary labors and contributions, and presents one of the finest examples of public spirit and intrepidity ever displayed. The Swiss telegraph, like the great wall of China, proceeds over mountains and across yawning chasms, totally regardless of the nature of the ground. It climbs the Pass of the Simplon, goes over the St. Gothard, and ascends the great chain of the Alps as if it were a gentle hill side. It appears to us that the construction of telegraph lines is conducted with great magnificence in England, especially the lines which have been laid under the billows of the ever-heaving sea. Thus there are three submarine cables running from England to the continent of Europe, and two between Scotland and Ireland, under a very tempestuous sea, sixty miles in width. We have not yet performed any such feats in electric engineering. We do not know whether, as in constant steam navigation across the Atlantic, we will allow England to lead us in the construction of an ocean telegraph, or not, but such, we must confess, appears to be the prospect at present. With respect to this great project, the *Review* makes the following scientific and interesting remarks:

"The restless spirit of English engineers seems bent on stretching out its lines to clasp the entire globe. Connecting England with America telegraphically is at the present moment engaging the attention of scientific and commercial men. The more daring engineers are sanguine of the practicability of laying a submarine cable directly across the Atlantic from Galway to Cape Race, Newfoundland. Now that we have Lieut. Maury's authentic determination of the existence of a shelf across the North Atlantic, the soundings on which are no where more than 1,500 fathoms, the feasibility of the project is tolerably certain. The principal question is, whether, if a line were laid, an electric current can be passed through 3,000 miles of cable. No doubt, by the expenditure of an enormous battery power, this might be accomplished through wires suspended in the air, but it is a question whether it can be done along a vast length of gutta percha coated wire passing through salt water. There is such a thing as *too great an insulation*.—Professor Faraday has shown that in such circumstances the wire becomes a Leyden jar, and may be so charged with electricity that a current cannot, without the greatest difficulty, move through it. This is the objection to a direct cable between the two continents; if, however, it can be overcome, doubtless the ocean path would, in all possible cases, be adopted where communications had to be made between civilized countries having intermediate barbarous or ungenial lands. To escape this at present dubious ocean path, it is proposed to carry the cable from the northernmost point of the highlands of Scotland to Iceland, by the way of Orkney, Shetland, and Ferroe islands—to lay it from Iceland across to the nearest point in Greenland, thence down the coast to Cape Farewell, where the cable would again take to the water, span Davis's straits, and make right away across Labrador to Upper Canada and Quebec. Here it would lock in with the North American meshwork of wires, which hold themselves out like an open hand for the European grasp. The plan seems quite feasible, for in no part of the journey would the cable be required to be more than 900 miles long."

The value of the electric telegraph is now generally appreciated. It is in use in Russia, Prussia, Austria, Belgium, Italy, France, Holland, Spain, India, Britain, and America.

By the *Review*, we learn that the lightning protector of Mr. Norton, of this city, is the one which is most successful in England. It is also hinted, that either the recording telegraph of Morse, or the chemical one of Bain must ultimately supersede the visual one of Wheatstone. In some respects the chemical telegraph has no superior, but for common general use it is not so much esteemed as that of Morse. The printing telegraph of House is the most ingenious of all telegraphs.—Bain's is in use to a limited extent in England as it is in this country, but we are positive that with the perforated circuit breaker, (illustrated on page 262, volume 3, SCIENTIFIC AMERICAN) and a continuous ribbon of prepared paper running out, as in the Morse telegraph, it could be employed to transmit long messages with ten times the rapidity of any other telegraph in use.

The electric telegraph has made man somewhat ubiquitous. The steamboat and railroad were grand inventions for the transportation of our bodies, but the telegraph is the railway of thought. By its iron nerves the mind, in one second, can impress its dictates on a strip of paper a thousand miles distant.—What a mysterious agency; what a wonderful endowment. The powers conferred upon man by the telegraph is an evidence of his divine descent.

### Great Trial of Fire Engines.

A great trial of fire engines took place at Springfield, Mass., on the 14th inst. A pole was erected 165 feet high, and the plan was for each engine to draw from the brook, play through 400 feet of hose, and through such pipes as it chose, perpendicularly into the air against the pole, which was marked off by feet in distinct black figures. Only one minute was allowed each engine for the trial. The prizes were awarded as follows:—1st. to the *Washington*, of Worcester, 165 feet; 2d. to the *Holyoke*, of Holyoke, 164 feet; 3d. to the *Hope*, of Great Barrington, 157½ feet; 4th. to the *Phœnix*, of Hartford, 157 feet. Some of the engines which promised to make fine displays, had the misfortune to burst their hose.

ANOTHER SUCH TRIAL.—On the 21st inst. a Firemen's Celebration and trial of engines took place at Hartford, Conn., the prizes being three trumpets valued at $300. The *Pacific*, of Chicopee, Mass., took the first, playing 174 feet high; the *Holyoke*, of Holyoke, Mass., took the second, playing 172 feet, and the *Deluge*, of Northampton, Mass., took the third, playing 163 feet high. The trial was confined entirely to Companies from abroad,—Massachusetts carried off all the prizes. We understand there were some engines from New York there.

### Fires and Fire Engines.

The Chief Engineer of this City, Alfred Carson, in his Annual Report, states that there have been 385 fires, with a loss on buildings of $827,000, and $2,073,000 on goods. "Doubtless," it says "one half of the fires are caused by incendiaries, and one quarter by carelessness." We believe this statement is no exaggeration. It is also stated in the Report that a steam fire engine will soon be on exhibition in this city. He recommends steam fire engines to be placed on the ferry boats—a good idea.

### Depositing Alloys.

We have received from J. F. Mascher, of Philadelphia, two lids of watch-spring barrels, both of which are gilded with a metallic alloy, the one with an alloy of gold and copper, and the other with an alloy of gold and silver. He has also deposited copper and zinc—forming brass—on a half dime coin. How far the deposition of alloys is carried on in the arts, if carried on at all, we cannot tell. We know that the pure metals alone are said to be employed by all the electrotypers who prepare plated goods for the market. The specimens which Mr. M. has sent us are very well done indeed.

### Greek Tombs.

At Canosa, (*Canusium*,) in Apulia, the excavations of Greek tombs have been continued. These tombs are in the form of small chambers, with columns and paintings, and are found to contain gold ornaments, consisting of collars, bracelets, diadems, ear-rings and rings, together with arms and vases. On the latter are designs of great beauty, representing on a black ground red figures of animals and birds, warriors, &c. These vases are supposed by some to be Egyptian, by others Babylonian. At Capulia excavations have led to the discovery of a tomb in the form of a chamber, with several paintings of women playing fifes, and other figures.

### A Great Raft Lost.

During the severe hurricane which visited our coasts on the 9th and 10th inst., a very large raft of wood, which left this city for the Connecticut River, under tow of a steamer, was completely dispersed on Long Island Sound. The raft consisted of 1500 sticks, valued at $15,000; only three of these sticks were brought in by the steamer.

### Artificial Production of Quinine.

At a late sitting of the Paris Academy of Sciences, M. Castets, manufacturing chemist at Puteauz, presented a sealed paper containing a description of the discovery which he had made of the artificial production of quinine. Should the pathological qualities of his compound be satisfactory, this discovery will be an important one.

© 1854 SCIENTIFIC AMERICAN, INC.

(For the Scientific American.)

**Electro-Chemistry---Batteries.**

*On a mode of obtaining plates for Smee's and Grove's batteries insusceptible of change by acids and mercury, and the economical recovery of waste plating and gilding solutions.*—Ever since the discovery of the chemico-mechanical battery, and the impulse given to electrical science by the processes of Elkington and the researches of Smee, it has been a hitherto unattainable problem to find some cheap, universal, and convenient material for the negative plate of intensity batteries. Platinum is used for that of Grove, and sometimes for the elegant instruments of Smee and Leeson, but apart from its high price, it is only in large cities where it can be obtained, and three years ago there was not an ounce for sale in the whole southern hemisphere. Besides this, platina, if accidentally brought in contact with acid and mercury, or amalgamated zinc, immediately combines with the quicksilver and becomes comparatively useless.

Silver is cheaper and equally efficacious, but can only be used in Smee's battery, and is more readily destroyed by mercury than even platina, and is then thoroughly irrecoverable. I have subjected plates so amalgamated to the action of strong acids and of a high red heat for some hours, only to verify the results of Gay-Lussac, and prove the impossibility of driving off the mercury. Bunsen uses coke-charcoal in his battery, but it must be prepared by machinery, and is as difficult to obtain as platinnm.

Walker recommends, as answering all the requisites, gas graphite, the deposit left in the tubes leading to the hydraulic main, and so it does—when you can get it. The gas works at Sydney, N. S. W., produce a good article, that produced at San Francisco is almost a non-conductor and perfectly worthless.

The experiments of Tunot and others in France on the manufacture of aluminum led to the hope that the object would soon be obtained, and on the publication in the March number of the *Philosophical Magazine*, of an article by Mr. Gore, of Birmingham, announcing the electro-deposition of aluminum and silicium, Dr. Deville, of this city, and myself, proceeded to repeat his highly interesting experiments. We found copper electro-silicised or electro-aluminized perfectly adapted by cheapness, universality, and indestructibility, to all the wants of the electrician. The most concentrated acids have no action upon plates so prepared, and they may be placed in contact with mercury and rendered negatively electric with absolute impunity if the operation be well performed.

Aluminum may be precipitated from the sulphate of alumina where fluor-spar cannot be obtained, but where it can, I much prefer precipitated silicon. It is an unnecessary trouble to prepare hydro-fluoric acid, as Mr. Gore recommended, it being difficult, expensive, and dangerous, without proper apparatus. It is simply requisite to prepare fluosilicic acid by mixing pulverized fluor-spar, glass or fine white sand, and sulphuric acid in a retort or bottle supplied with a bent tube, and receive the gaseous product in water—filter to remove deposited silica, acidulate with chlorohydric acid, and it is ready for use.

Place the article to be silicised in the solution in connection with the negative pole of a battery, (Smee's, 4 pairs) of the same extent of surface; connect the positive pole with a piece of amalgamated zinc also of same surface, and immerse in dilute sulphuric acid separated from the first solution by a porous diaphragm. It is best to keep the solution hot by a spirit lamp. Aluminum may be deposited from sulphate of alumina formed by digesting pipe clay in sulphuric acid or caustic potash, but not so readily. The expense of depositing these metals is very little more than that of reducing copper from the sulphate, and quite as readily accomplished.

It is a fact well known to electro-platers and gilders, that their solutions will sometimes become very inert, so that a strong current of electricity may be passed through without depositing any metal, to the great loss of power and annoyance of the operator. The cause of this inaction is not thoroughly known. Smee and Ruoly attribute it to the absorption of oxygen. At any rate it is without remedy, and the electro-gilder's only resource is to reduce his solution by heat, and obtain the precious metals it contains. After a long series of ineffectual attempts to reduce the expense of this operation, I have at last, I believe, succeeded.

The solution having been eveporated to dryness, is treated with boiling absolute alcohol, which takes up the free cyanide of potassium, and deposits it again on cooling. The residue is decomposed by hydro-chloric acid, and the resultant proto-cyanide of gold or silver after thorough edulcoration is perfectly adapted to the formation of new solution.

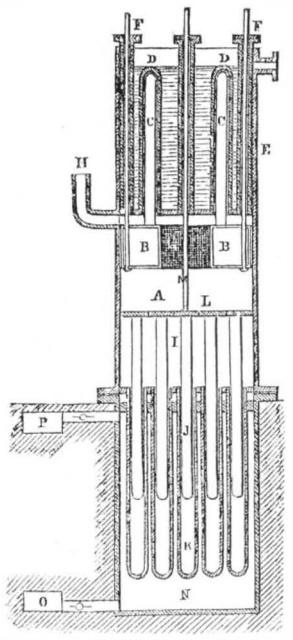
By this process no metal is lost, and only one equivalent of K. Cy. to each equivalent of protoxyd of the metal.

ROBERT L. D'AUMAILE, Chemist,
San Francisco, Aug. 12th, 1854.

**Separating Silver from Lead.**

At the last annual gathering of the Royal Cornwall Polytechnic Society, Mr. J. A. Phillips, of London, at the request of the chairman, addressed to the Society some observations, in which he stated that one of the most important improvements which had recently been made in the metallurgical art came into operation last year, and is the separation of silver from lead by means of zinc. After describing the old process of separation, and the subsequent process discovered by Mr. Pattinson, of Newcastle-on-Tyne, involving several crystallizations and a final cupellation, he stated that still more recently a patent had been taken out by Mr. Parkes for a process by which he separates the silver entirely by one operation. To do this, the alloy of silver and lead is melted in the usual way in a large iron pot. To this a small quantity, a few pounds of zinc per tun, is added, the whole mixed up and allowed to remain a short time. By this means the silver is brought to the surface in the form of alloy with the zinc, and this mixture is subsequently skimmed off and treated for the silver it contains. In order to do this the zinc is first partially separated by oxydation, and the residual alloys afterwards treated in the cupel. In connection with the purification of metals, he might mention some of his own experiments in regard to tin. The tin from Peru and some other countries contains a large amount of tungsten, or wolfram, which very much depreciates its value. Till recently this tin could only be employed for very common purposes, such as making tin pipes and other things, which did not require tin of good quality. But in analysing some of this tin he happened to discover a process by which the separation was very easily effected, and this process has been recently patented. It consists in taking impure tin, containing from 5 to 10 per cent. of tungsten (worth 25*l*. per tun less than tin of ordinary purity), granulating it by melting it in a reverberatory furnace, and allowing it to flow in a vessel containing water. This granulated tin is then placed in a pan with common hydrochloric acid, which may be obtained from the soda maufacturers at also a nominal price.—This being heated, hydrogen gas is evolved, and a solution of chloride of tin is obtained. In this operation it is necessary the tin should be present in excess; unless it be so a certain portion of tungsten is dissolved. Should, however, the operation be carried on too far, and a portion of tungsten be dissolved, the addition of a small quantity of impure tin precipitates the tungsten, and chloride of tin, free from tungsten, is obtained. This is turned off into a vat, in which more granulated impure tin is placed, and any arsenic or antimony remaining is there deposited, and a pure solution of chloride of tin is obtained. From this we have to get the chemically pure tin we require, and which is quite as good as the stream tin of Cornwall. Into this bath we put bars of metallic zinc, which pricipitate the tin in a spongy mass, when instead of chloride of tin we get chloride of zinc. The tin thus produced may be fused into bars, or sold as the best tin. The chloride of zinc must be used so as to lower the expense of the whole process. To do this it is precipitated by milk of lime, or common chalk; we then get oxyd of zinc, which is largely used as a pigment; and to give it sufficient opaqueness for that purpose, the washed oxyd of zinc is heated to redness, when it is found to be equal to the ordinary oxyd of zinc obtained by sublimation.—[London Mechanics' Magazine.

**New Hot Air Engine.**




In our list of patent claims this week, it will be perceived that a patent has been taken out in our Republic by Messrs. Napier & Rankine, of Glasgow, Scotland, for a modification in the construction of hot-air engines. As very little knowledge of the nature of what is claimed to be an improvement can be obtained from reading the claims, we present the following engraving to convey a very good general idea of what it is. The figure is a vertical section of one of the air receivers, as communicating with the upper portion of the actual working cylinder, a similar apparatus being arranged to work in connection with the lower end of the main cylinder.

The chamber, A, has within it a pluuger, B, fitted with a set of vertical rod-shaped plungers, C, which slide inside the closed tubes, D, in the water tank, E. Two rods, F, give the requisite traverse to the plunger, which has a central circular opening, G, filled with wires or loose strips of metal. A pipe, H, forms the communication between the receiver and the top of the cylinder. At I is a heat screen, composed of a series of rod-shaped plungers, J, working loosely within the closed tubes, K. These plungers are fitted upon a perforated plate, L, which receives a traverse movement from a central rod, M. The tubes, K, are contained within the closed chamber, N, heated by a furnace, the flame and heated air entering by the flue, O, and flowing off by the flue, P, to the chimney.

When the plunger, B, is lowered in the receiver, A, it sends the air through the passage, O, to the top of the receiver, and into the tubes, D, in the water tank, so that such heat as may have reached it from the flame will now be abstracted. At the same time the plunger of the corresponding apparatus for the lower part of the cylinder, will be lifted to the top of its traverse, sending the air out of the upper tubes and the upper portion of the body of the receiver, down through the central permeable mass or passage. The heat screen, I, is also lifted and dropped, the effect being that the air in the lower part of the receiver, A, is made to circulate rapidly over the surface of the rods, J, and through the heated tubes, K, thus taking up a certain quantity of heat. The consequent expansion of this heated air then produces pressure through the passage leading to the top of the cylinder, so as to act upon the working piston.

During the end of the down stroke and the commencement of the up stroke of the piston, the heat screen lies at the bottom of the receiver. The plunger, B, descends, and the air, with the exception of a trifling quantity, passes through the permeable mass, G, giving out a large portion of its sensible heat to the wires therein, the rest of the heat being abstracted by the water in the tank, E. During the end of the up stroke and the beginning of the down stroke, the plunger, B, rises, the air descends through the passage, G, and takes up from the wires the greater part of its sensible heat, formerly lost.

During the first half of the down stroke, the heat screen is raised and dropped, and the air, by circulating over the rods, J, and through the heated tubes, K, acquires the rest of the sensible heat necessary to elevate its temperature, and also the latent heat necessary to expand it. This completes the routine of operations in the receiver connected with the upper end of the cylinder. The movements for the other end are precisely the same.

This hot air engine consists in using the same air over and over again, by cooling it, (after it has acted upon the piston) in a cold water surface condenser. We do not know the ratio of difference in time, in cooling air and steam by surface contact, or by mingling the air with the water, but we know that steam can be condensed eight times faster, by contact condensation, in the ordinary condenser, than by surface contact. We presume that hot air is subject to the same disadvantages, and must therefore conclude that this invention is founded in error.

There is nothing about this hot air arrangement for an engine worthy of such long and hard-headed Scotchmen as are said to come from about Glasgow. If the inventors are engineers, there is much about it discreditable to them, for the value of its power may well be estimated by the rapidity with which the air can be deprived of its heat in the condenser.

We do not know the reasons which actuated the inventors in securing an American patent; but in all likelihood they were influenced by those papers in our country which deceived the public by their laudations of the *Ericsson*. They perhaps thought that this was the very country for the successful sale and introduction of their patent, and they will now be surprised to learn that the *Ericsson*, as we recommended, has been converted into a steamship.

**Making Diamonds.**

One of the most curious sights at Paris, or indeed in the whole world, is afforded by a visit to the vast atelier of M. Bourguignon, situated at Barriere de Trone, where the whole process of transforming a few grains of dirty heavy looking sand into a diamond of the purest water, is daily going on, with the avowed purpose of deceiving everybody but the buyer. The sand employed, and upon which everything depends, is found in the Forest of Fontainbleau, and enjoys so great a reputation in the trade, that large quantities are exported. The coloring matter for imitating emeralds, rubies, and sapphires, is entirely mineral, and has been brought to high perfection by M. Bourguignon. He maintains in constant employment about a hundred workmen, besides a number of women and young girls, whose business it is to polish the colored stones, and line the false pearls with fish scales and wax.—[London Leader.

**Curious Fish.**

Mr. James Robinson, of Manchester, N. H., while gunning along the bank of the Connecticut River, two miles below this city, a day or two since, discovered two singular looking fish swimming beside each other, near the surface of the water, and killed them both at a single shot. On taking them from the water they were found to measure each 12½ inches in length and two inches in circumference, their bodies very nearly resembling those of the common pickerel, but in the place where the pickerel's head ought to have been, they tapered off into round, sharp pointed bills, three inches in length, opening close up to the eyes, and exhibiting four rows of shark's teeth in minature. The "oldest inhabitant" on the banks of the river, never before saw the like among its finny population.—[Springfield Republican.

© 1854 SCIENTIFIC AMERICAN, INC.

# New Inventions.

### Converting Reciprocating Rectilinear into Rotary Motion.

Numerous plans have been proposed for converting one kind of motion into another, the great object being to do so in the best manner, so as to convey the full power of the driving force to the object to be driven. A new method for doing this has been invented by Wm. H. Amadon, of Madison, Wis., who has taken measures to secure a patent for the same. It consists in so attaching the crank pin to the crank, that its distance from the axis may be varied during its revolution, and in so controlling its motion as to cause it to move in an ellipse, the shorter diameter of which corresponds with the length of the stroke of the engine piston, from which the crank derives its motion. In this way the crank pin is caused to receive a greater movement than a common crank having a fixed length equal to half the length of stroke; its velocity, therefore, relatively to that of the piston is greater, exceeding that of the common crank in the same proportion as the circumference of an ellipse exceeds that of a circle, the diameter of which is equal to the shorter one of the former.

### Shafting Hanger.

Peter Teal, of Philadelphia, has taken measures to secure a patent for an improved adjustable hanger for shafting. The hanger contains a ring and screw rod, by which the line of shafting can be adjusted and set with great ease and correctness. This is a very useful invention; it is necessary for the proper working of machinery driven from lines of shafting, that the latter should be correctly set and easily adjusted, for it is well known that although a line of shafting in any shop or factory may be set perfectly correct today, it may be out of line and require adjusting to-morrow. The sagging of beams, the strain upon one part of the shafting more than another, tend to thrust it out of line. As an easy method of adjusting lines of shafting at all times, it is a great desideratum; this is provided for by this improvement.

### Self-Closing Water Faucets.

Self-closing water faucets are not new, but at the same time it is not to be supposed they are all perfect. The great object of having a self-closing water faucet, is to prevent the water running from the pipe, if by accident it should be left open. Much damage has been done to buildings and goods in this city by water faucets being left open, and the water allowed to overflow during the night hours in the upper stories. The common self-closing faucet consists of a spring which forces the piston valve into its seat, whenever the pressure is removed from it. An improvement to render said faucets more perfect in their operation, as they soon get out of order, has been made by John Butler, of Williamsburg, N. Y.,(who has taken measures to secure a patent)—which consists in causing the spring valve, when in its seat, always to fit water tight, by the pressure of the water in the inlet passage.

### Hub Boring Machine.

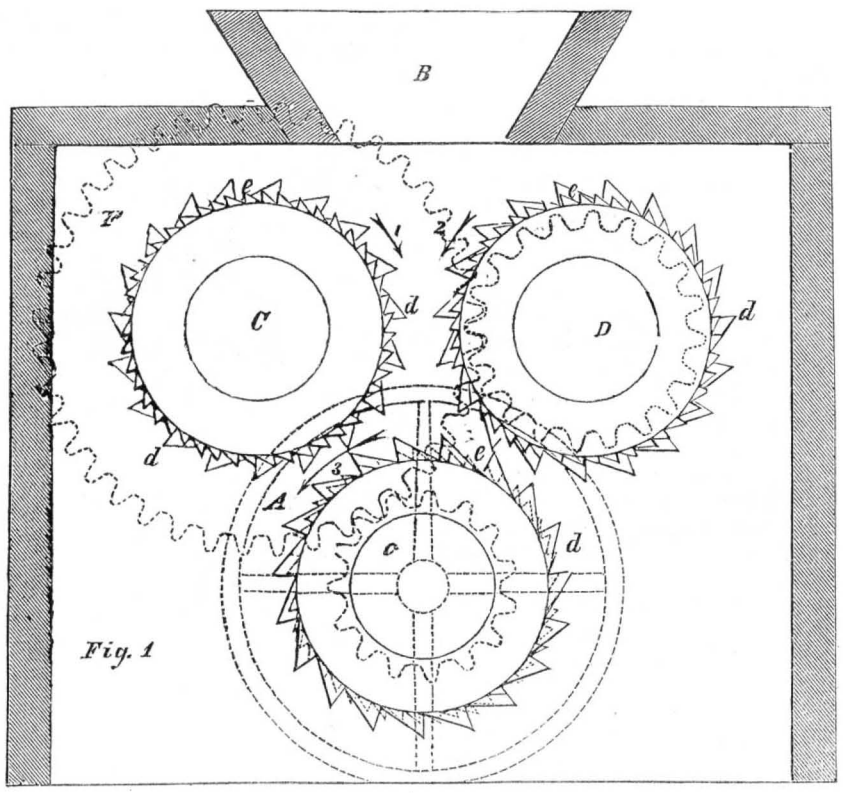
An improvement in a machine for boring hubs has been invented by L. A. Dole, of Salem, Ohio, in which the feeding part is so arranged and combined with a feed screw, gauge plate, and mandril, that the latter is made to adjust itself at the instant the shoulder of the hub has been cut the required depth, and then be turned with a screw to allow the cutter to square the shoulder. A self centering lathe chuck is employed, which consists of a scroll screw, and sliding jaws, combined with a mandril passing through the center having a cutter secured on its extremity for boring out the hub, by which arrangement a perfectly true hole is always bored out. Measures have been taken to secure a patent.

### Securing and Setting Harrow Teeth.

E. L. Hagar, of Frankfort, N. Y., has applied for a patent for an improved method of constructing harrows, by which the teeth can be easily adjusted, and set vertically, obliquely, and at any depth desired. The objects attained by this improvement are of no small importance to our agriculturists.

Will some of our readers give us their experience in constructing ice houses with a vault underneath the ice, for storing fruit, thus keeping it fresh and dry?

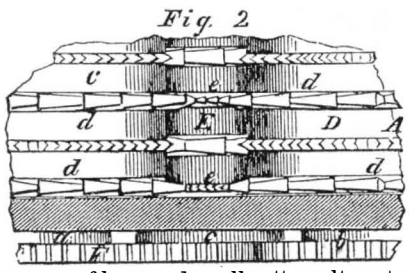
## CIDER MILL CUTTERS.




The annexed engravings are views of an improvement in Cider Mills, for which a patent was granted to Daniel Zeigler, of Lewistown, Mifflin Co., Pa., on the 25th of July last

Figure 1 is a vertical longitudinal section, and figure 2 is a plan view, the top being removed. The same letters refer to like parts.

This cider mill has three grinding rollers, two arranged on the same horizontal plane, and the third placed centrally under the other two—each having several rows of teeth or spur cutters round its periphery. The cutters in one row are of the same size, but the



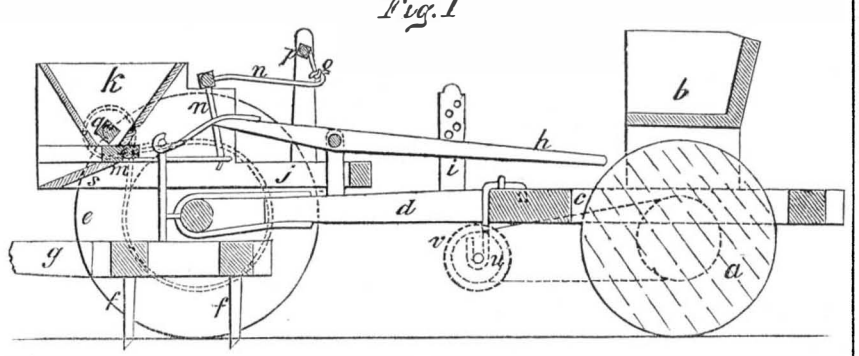

rows are of large and small cutters alternately. Each roller is made to revolve independently at a greater or less velocity, and the largest teeth of the lower one are made to operate in connection with the smallest teeth of the upper rollers, and the smaller ones in the same manner.

A is the case in which the rollers are arranged; B is the hopper into which the apples are fed; C D E are the grinding rollers; *d e* are the spur teeth on the rollers, the one row being double the size of the others. The largest teeth of the upper rollers are set in line with the smallest teeth in the lower roller; this allows of the upper and lower rollers being set very close together. The arrows, 1 2 3, indicate the directions of the cutting rollers. One of the upper rollers has a greater velocity than the other, and the lower one has the greater velocity of the three. Owing to this mode of operation, the apples are reduced into very small pieces between the first two rollers, and then reduced to fine pommace by the action of the lower cutting roller. These rollers receive motion by the cog gearing from the large wheel, F, the separate wheels being of such size as to give the cutter rollers their different velocities. Owing to the different sized cutters, and their arrangement with one another on the separate rollers, also the varied velocities of the cutters, the rollers and knives clean themselves in a very superior manner, whilst at the same time they act most effectually in reducing the apples to a fine condition. The claim is for the special arrangement of the cutters, as set forth, and the different velocities of the cutting rollers in connection with their arrangement. This apple grinding machine to prepare them for the pressing is exceedingly simple and efficacious.

More information may be obtained by letter addressed to Mr. Zeigler.

## SEEDING ROLLER AND HARROW MACHINE.

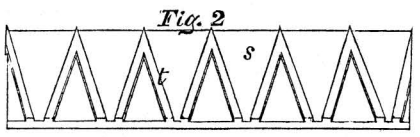
*Fig. 1*




The accompanying fig. 1 is a vertical longitudinal section of a machine, combining the above-named characteristics, to be used for agricultural purposes, and for which a patent was granted to Daniel Hill, of Harrisville, Ind., on the 27th of last June.

*a* is the roller; *b* the driver's seat; *e* the rear hounds; *d* the coupling pole; *e* one end of the wheels, and *f* the suspended adjustable harrow. *g* is the draft pole; *h* is a treddle, and *i* is a gauge post, with pins placed in it at various hights. A frame, *j*, occupying the position of the fore hounds supports the seed hopper, *k*, which is constructed with the usual arrangement of a pair of converging boards, which leave a narrow aperture between the lower edges. *m* is a mouth-piece capable of sliding backwards and forwards, and is adjusted by a set of levers, *n*, which are acted by a cord, *o*, which passes over a small windlass, *p*. There is a bar, *q*, placed near the lower narrow opening of the hopper and so close to the converging boards and to the gauge board, *m*, as to transmit the desired amount of grain to the aperture. This bar is rotated by a band connected to a pulley on the wheel shaft. *s* is a board placed below the aperture of the seed box; it slopes downward and distributes and carries the seed on its way to the ground. One side of this board is plain, the other has ridges, *l*, forming gutters on it, so as to conduct the grain in lines for drill planting, and it can thus be adapted for drill or broad-cast sowing, as shown in fig. 2.

*Fig. 2*




For grass seed there is a cylinder, *u*, which is perforated with holes; it is suspended in front of the roller, *a*. This cylinder is driven by a band passing over a pulley on the roller shaft. *v* is the door through which their cylinder is supplied.

It will be observed that the harrow teeth follow after the grain, covering all up. The grass seed is merely pressed down by the roller, that being sufficient.

Mr. Hill obtained a patent on a seed planter on the 11th of October last, in which the most of the parts described in this are represented and described. The claim in this patent is for the board, *s*, made plain on one side, and with converging gutters on the other side, to sow either broadcast or in drills.

More information respecting patent rights, &c., may be obtained by letter addressed to the patentee.

### Improved School Desk.

Virgil Woodcock, of Swanzey, N. H., has taken measures to secure a patent for an improved method of constructing desks for schools, by which the various rows of desks are combined in such a manner, that while each scholar is properly separated, a considerable saving in space is effected, and also in the cost of their erection. The seats are arranged diagonally in respect to each other, which is an important advantage, preventing the occupants from communicating so easily with each other, as by sitting in parallel lines as in the common mode. This plan of constructing desks in schools will enable teachers to control the scholars more easily than they can at present,—something much to be desired by all those who "teach the young idea how to shoot."

### The Water Wheel Challenge.

Having received a great number of communications on the subject of the Water Wheel Challenge of Mr. Vandewater, we find that it will be out of place, and is impossible, for us to notice them all; we must therefore refer all who wish to enter the lists with that gentleman to communicate with him directly by letter. When the trial takes place (if ever it does) we shall be happy to present the results, for information, to all those who are interested in Water Wheels, and their number is legion.

### Gold Fish.

The Portsmouth *Journal* says these beautiful specimens of the finny tribe may be rapidly increased with very little trouble. A fresh water pond—no matter whether made from springs or from rain, in which no destructive fish have a home—is all that is needed for their residence and rapid increase.—The coldest weather of the winter, even though the ice confine them, does them no injury. In a pond on the Portsmouth City Farm some of these fish were put a few years ago. From these tens of thousands have been taken, and may be seen, not only in numerous globes in our own city, but also in many distant places in New England.

A diamond has recently been found in Manchester, Virginia, which is said to be worth three or four thousand dollars. A scientific examination shows that it refracts, and if rubbed on dry cloth or leather, acquires positive electricity, and on being suddenly removed from the sun's rays into the dark, it sends forth sparks of light resembling fairy-like blazing stars.

© 1854 SCIENTIFIC AMERICAN, INC.

Scientific American.

NEW YORK, SEPTEMBER 30, 1854.

### Prizes, Clubs, and Mechanics' Societies.

It appears to us, since the present volume of the SCIENTIFIC AMERICAN commenced, that there is not that spirit displayed in the formation of large clubs of subscribers that was exhibited by our mechanics last year. The candidates for prizes, although as numerous, have not canvassed so actively, or the solicited have not responded so readily, and from present appearances, such lists as gained the lowest prizes last year will gain the highest this; and we shall feel pained when the first of January comes, to announce the award of one hundred dollars, and less amounts, to the sum of five hundred and seventy dollars, for a succession of clubs whose numbers are so meager that our total receipts from the competitors will not amount to enough to pay the premiums. It will be no difficult matter for clubs and candidates who have not yet entered the field of contest for the prizes, to obtain them. There is not a single manufacturing district in our country but can send us larger lists than those which took the highest prizes last year. Perhaps many of our readers may not be aware that the prizes are awarded to the largest list of subscribers, whether formed by associations, clubbing together, or by a canvasser. Some of the prizes obtained last year were secured by clubs through a representative acting for them. The same opportunity is again presented to our mechanics and artisans, and we consider it an excellent one for the members of mechanics' societies to exert themselves among their members to get a list in numbers adequate to draw a prize, and make that the basis of a fund for purchasing a library or for subscribing to other standard scientific and mechanical publications, or even to be used to pay rent, fuel, light, etc., for their reading room. It is also quite possible for the members of a large association to form two clubs, and thus obtain two prizes.

From experience we know something of the benefits of Mechanics' Associations. The mechanics of every city and village should have some organization for the improvement of their minds and the cultivation of the social feeling. Each society should have a select library for reference, and the members should meet regularly at stated periods for mutual conversation, and the friendly discussion of those questions relating to science and mechanism, which are suggested by the periodicals they are in the habit of reading. Our prizes present inducements for the mechanics in many places to club together as subscribers and to form Associations. By so doing they will become possessed of the only weekly periodical in our country devoted to science, art, and mechanism, new inventions, and discoveries, and at the same time, they have the prospect of obtaining solid funds to be used in disbursing for books or useful periodicals to the benefit of themselves and their Associations.

We have thrown out these suggestions for the consideration of our mechanics, in order to induce them to form clubs, well knowing they are worthy of being acted upon by all those who desire to be intelligent, and who wish to keep themselves informed of what is doing in the world of science and invention.

### The French Exhibition—Important to American Exhibitors.

It is well known to most of our readers that a grand Exhibition of the World's Industry will be open in Paris early in May next.

A spacious and elegant structure is now in progress under the national sanction, for the repository and exhibition of articles representing the great industrial arts of the world in their most diverse and pleasing forms.—The admitted genius of the mechanic and artisan, united to the fine taste of the French in all that relates to the ornamental arts, give assurance that it will form an attractive and sublime spectacle, worthy of the attention of our people. Under proper arrangements the Exhibition may be rendered a source of profit to American inventors and manufacturers, and at the same time shed luster upon our country and its vast resources.

To this end we are perfecting, and shall announce very soon, our plans for receiving at our agency in Paris, under the superintendence of Gardissal & Co., all such articles as may be entrusted to our care. Our object will be to take charge of packages, place the articles upon exhibition, and give personal attention to the same, secure patents for new inventions, and attend to their sale. We will also attend to re-packing and returning all articles not disposed of. These advantages are of great importance to all who desire to be represented at the French Exhibition, and to render our purposes fully effective, it is expected that one of our firm will visit the Exhibition, and attend personally to such commissions as may be entrusted to his care.—This, aside from the highly responsible character of our Paris Agents, will give assurance that American interests and American inventors will not be neglected. Parties desiring to exhibit articles in the "Palais de L'Industrie," will find it advantageous to correspond with us upon the subject, and we hope this announcement will awaken a general interest among our people, towards the approaching exhibition.

### Beef---the Cause of its High Price and the Remedy.

It is a well known fact that the price of beef has been continually advancing in the Atlantic States for a number of years past, and is at present so high in New York and other cities, that it is almost as difficult for our laboring population to obtain a meat diet, as it is for those of some of the European nations. The cause of this great and rapid rise in the price of meat is not an uninteresting inquiry. In this case, the supply and demand regulate the price; it is not governed, as some suppose, by a combination of speculators, but its scarcity. And why this scarcity? It is caused by the insane policy of our farmers selling their calves to the butchers, instead of raising them for milch cows, oxen, and beeves. The prices given for butter and cheese have been so good, recently, that our farmers, to save milk, get rid of their calves as soon as possible. Many of them also, in distant places, have such wrong notions respecting the trouble and expense of rearing calves, that rather than do so they destroy them for the sake of their skins. In less civilized countries, such as Brazil, more wisdom is exhibited than with us, for it is a penal offence to kill calves there, and that is one reason why that country is always so able to furnish us with hides for our leather, and tallow for our candles and soap. Our farmers, were they wise, could furnish all the hides we require, but because we are absurdly fond of veal—very unhealthy meat at best—and because our farmers are so blind to their own interests in selling and destroying their calves, our country has to send abroad for hides and tallow, and the working classes in our cities have to suffer for the want of proper food. It has been estimated that 43,000 calves were butchered and consumed in this city alone last year. Look at what a quantity of beef these would have supplied, if they had been raised and fed for four years. Allowing each to have attained a weight of only 300 lbs., it would amount to 12,900,000, nearly thirteen million pounds, which would furnish every man, woman, and child, in New York, with one pound of beef every day for three weeks, whereas it only furnished a like amount to each of poor veal for about three days. These facts account for the rising price of beef. The remedy is for farmers to raise their calves; let them have warm housing for winter, and let them use more boiled food and roots for their feed, and they will find an ample remuneration for so doing, and, at the same time, they will have the consolation of benefitting their fellow men who are engaged in other occupations. The trouble of weaning and feeding young calves has been reduced to a very simple process by an invention of R. A. Moss, of South Norwalk, Conn., by which a boy can attend fifty of them, and by which they are fed in a very natural manner, either with gruel or hay tea. We are positive that our people in consuming so much veal as food, and our farmers in selling and destroying so many calves, stand greatly in their own light. The present high price of beef, and a great deal of that so very poor, demands that something should be done to provide a remedy, and the foregoing suggestions are presented for that purpose.

### Improved Chain Hook.

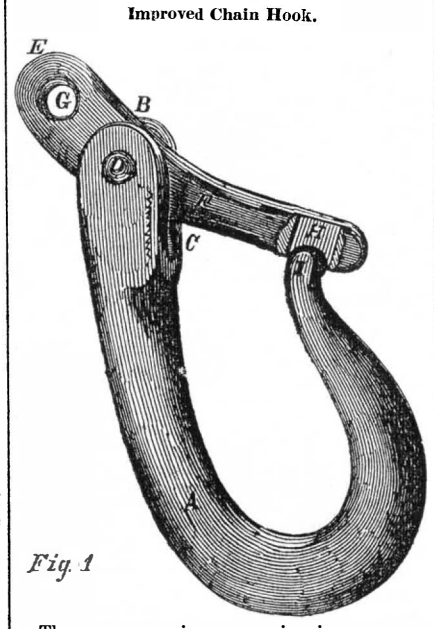


Fig. 1

The accompanying engraving is a perspective view of an improvement in Chain Hooks, for which a patent was granted to Willis Straw, of Dalton, N. H., on the 11th of last July.

The nature of the invention consists in attaching to a chain hook, A, of ordinary form, a guard bar, F, one end, E, of which is attached to the chain by means of a link passing through the eye, G. The guard is attached to the hook at B, by a joint, D, and there is a recess, C, between the cheeks of the hook to allow the ends of the guard bar to be raised and lowered for catching the hook into the object to be dragged, and to allow the bar to fall into place and guard the point of the hook. At the point, I, of the hook, there is a recess, H, in the guard bar, F. It will readily be observed that when the drawing force is applied at G, on the chain, that the lower end of the guard bar will be depressed, and the recess, H, will slide over the point, I, of the hook, thereby effectually preventing the hook from catching into any object while the load is being dragged.

This appears to be an excellent improvement; the hook is simple of construction as shown, and as all farmers and lumbermen, in logging, and while engaged in many other operations, have experienced great trouble from the common hooks catching into roots, &c., and also injuring the legs of both horses and oxen, they will be able to appreciate this improvement. A spring, it has been suggested, might be employed to keep the point of the hook in the guard recess, but springs are liable to get out of order and be broken by such rough work as that for which chains are employed.

More information may be obtained by letter addressed to the patentee.

### Mouths of the Mississippi.

This great river, unfortunately for its navigation by ships, does not discharge its large volume of water by one, but a number of passages, each comparatively shallow. Owing to the large amount of mud brought down by the waters, these passes frequently shoal, and this causes our government no small amount of trouble and expense annually. If it were possible to direct all the waters of this river through one pass, there would be an abundance of water to float the largest ships, which is not the case at present. We have no doubt but the concentrated current would scour the channel so effectually as to prevent it from ever shoaling, as is now the case. This is caused by the spreading of the waters at the embouchures, thereby arresting their velocity. To accomplish this result would require a great expenditure at first, but ultimately it would prove the most economical plan. We understand that the navigable passes are almost unnavigable at present from the mud accumulations; it is therefore highly important that some effectual means should speedily be resorted to in order to provide a permanent remedy for such an evil. The waters can be directed from the small passes into the larger ones, by sinking vessels laden with stones and by dyking out. We hope at least that something effectual will be projected and acted upon by government engineers, for assuredly it is no credit to us as a great nation that the navigation of such a river should be so often obstructed at its mouth, when there is such an abundance of means in the Treasury to accomplish any engineering work, however difficult or great.

### Nova Scotia Industrial Exhibition.

Elbridge G. Fuller, our enterprising agent for the SCIENTIFIC AMERICAN, at Halifax, N.S., has published and sent us a fine large lithograph plate of the Parliament Building in Halifax, which has been appropriated for the first Exhibition of Arts and Industry in that enterprising Province; also a fine lithograph plate of the City and Harbor of Halifax.—These pictures are exceedingly well executed, and we are glad to see that they are for sale by Messrs. Dewitt & Davenport, this city. This Exhibition will be opened in the early part of next month, and we understand that quite a large number of articles have been, through the agency of Mr. Fuller, forwarded from Boston for it. The building for the Exhibition is a very fine one, and does great credit to the people of Halifax. There will no doubt be a goodly number of visitors to it from our Eastern States. Prizes are offered for a number of articles for which we in the States are not a little distinguished,—such as pegged boots and shoes, model sailing vessels, stoves, cut nails, safes, carriages, tin ware, barrels, and all kinds of agricultural implements. The prizes are offered in money, $20 being for the best plow, and $30 for the model of the best sailing boat.

### Baby Exhibition.

The Ohio Agricultural Society has offered premiums for the three finest specimens of Babies that shall be exhibited at its Annual Fair, to be held next month. We had no idea that any respectable Society, especially a Society representing the intelligence of the yeomen of any State in the Union, contained one man so wanting in real solid good sense as to propose such a ridiculous exhibition. Do the farmers of Ohio—the fathers and mothers—look upon their babies in the same light as they do their pigs and calves, that they thus come forward through their Agricultural Society and offer prizes for the three most approved specimens? During the past two years we have seen notices of a number of such exhibitions in various parts of our country, but we looked upon them as mere coteries of pedantic fathers and mothers.

### The New York State Fair.

The Annual Cattle Show and Exhibition of the New York Agricultural Society, in connection with the American Institute, will be held in Hamilton Square, this city, on the first week of next month. Tents and sheds are now being erected, and every accommodation will be afforded for exhibitors. It is generally believed that it will be a grand Exhibition.

### $570 IN PRIZES.

The Publishers of the SCIENTIFIC AMERICAN offer the following Cash Prizes for the fourteen largest lists of subscribers sent in by the 1st of January, 1855.

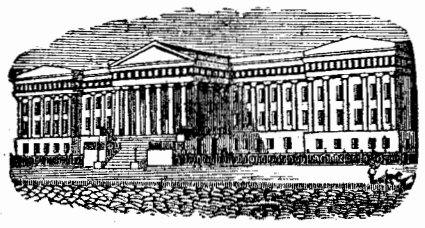
**$100 will be given for the largest list,**
**$75 for the 2nd, $35 for the 8th,**
**$65 for the 3rd, $30 for the 9th,**
**$55 for the 4th, $25 for the 10th,**
**$50 for the 5th, $20 for the 11th,**
**$45 for the 6th, $15 for the 12th,**
**$40 for the 7th, $10 for the 13th,**
**and $5 for the 14th**

The cash will be paid to the order of each successful competitor; and the name, residence, and number of subscribers sent by each will be published in the SCIENTIFIC AMERICAN, in the first number that issues after the 1st of January, so as to avoid mistakes.

Subscriptions can be sent at any time and from any post town. A register will be kept of the number as received, duly credited to the person sending them.

☞ See new Prospectus on the last page.

© 1854 SCIENTIFIC AMERICAN, INC.



[Reported Officially for the Scientific American.]

## LIST OF PATENT CLAIMS

**Issued from the United States Patent Office.**

FOR THE WEEK ENDING SEPTEMBER 19, 1854.

BREECH-LOADING FIRE-ARMS—H. W. Adams, of New York City: I do not claim the breech roller having a passage through it, so that when placed in one position in the chamber which receives it, it will form a prolongation of the bore, and when placed in another position will close the rear end of the bore.

But I claim, first, the combination with the roller of the common gun nipple, said nipple being inserted at one end of the roller which projects outwardly from the said chamber, and communicating with a vent bored to the surface of the central solid part of the roller, which covers the end of the barrel, so as to convey fire from the nipple to the center of the charge in front of the roller, as set forth.

Second, though I do not claim the employment of a groove or grooves as made in the charge holder of Alonzo D. Perry, I claim forming a cavity or space within the chamber which contains the breech roller, when the said cavity extends all round the roller, and so nearly from end to end thereof as to leave only sufficient bearing at the ends to keep the roller in proper place, and is for the purpose of reducing the friction of the roller, and for the prevention of its sticking tight in the chamber, as set forth.

Third, fitting the opening in the rear part of the breech supporter with a tube which enters the space between the breech roller and its seat, and fits closely up to the roller, serving the double purpose of giving the roller a bearing opposite to where the force of the explosion of the charge acts upon it, and of preventing the escape of the fire or gas through the back of the breech supporter.

Fourth, the chamber detached from the barrel and fitting into the breech supporter, so as to be incapable of turning therein, but to be capable of being forced up towards or into closer contact with the breech roller by the screwing in of the barrel, as set forth.

DRESSING MILL STONES—E. C. Badger, of Warner, N. H.: I claim the guide with the narrow slot in a straight line or such curve as is desired to give the furrow, in which a projection from the frame, carrying the pick, works, and by which the pick is guided, as it is drawn out to cut the furrow desired, and this either with or without the thread screw by which said guide is moved radially around the cylinder and spindle.

STEAM ENGINES—William Black, of Alleghany, Pa.: I do not claim forcing unmixed water into a highly heated cylinder. Nor do I claim re-heating and re-densifying steam that has been used in one cylinder to expand and use it in another cylinder of larger size, as this is set forth in a patent granted to Jas. Frost in 1841.

Nor do I claim having discovered a new principle in super-heating steam apart from water, such as is set forth in an application for a patent by Jas. Frost, in 1845.

Nor do I claim the discovery of a mode of creating power by super-heating steam as it passes between two engines, one low and one high pressure.

Nor to have invented a mode of using the spent or free steam for cooling and warming water, as set forth in an application for a patent by Jas. Frost in 1849.

Nor do I claim using highly heated air as a motor or for generating steam by passing highly heated air through water as it falls from one shelf to another; such was done by De Rosen, and is described in Newton's London Journal, Vol. 1, 2nd ed., page 156.

But I claim mixing, by means of a revolving brush or some other mechanical equivalent, small drops or particles of water in the steam, as set forth.

Also, the immersing the ramming chambers or pumps in water or its equivalent, for the purpose of chilling the saturated steam suddenly and just before it is forced into the heated cylinder, as set forth.

Also, the ramming or forcing the highly saturated steam into the heated cylinders, as set forth.

MAIZE HARVESTERS—Jas. S, Burnham, of West Jefferson, Ohio: I claim the employment and arrangement of the oblique self-adjusting cutting and sustaining platform having a flange on its back edge, and cutters arranged or formed on its front edge near either end, as described.

I also claim the employment of the horizontal collecting reels, having their arms made elastic and of cima reversa shape, in combination with the guards, oblique fenders, guides, and receivers or bundlers, as described.

Also, the arrangement of the receiver arms or bundlers moved by the shifting lever and connecting rod, for the purpose of readily effecting the discharge of the stalks, as described.

SAWING SHINGLES—Chas. J. Conrad, of Lower Augusta Township, Pa.: I am aware that shingle machines have been constructed with racks having notches at equal distances, requiring much longer frames than mine to secure the equality of the shingles in size and shape; therefore such I do not claim.

I claim the use or employment of the notched register plates, one being constructed with equi-distant notches the other with notches placed alternately at about three-fourths and one-fourth of the distances of the first mentioned, in combination with the register frame, its counterpoise weight and the levers, as described.

TELEGRAPHIC KEYS—John Davis, of New Bedford, Mass.: I do not confine my invention solely to the producing of the dots and marks which Morse uses in operating his Telegraphic Register: any arrangement may be produced.

Neither do I confine my invention to the operating of Morse's Telagraphic Register: it may be applied to any telegraphic registering apparatus where spaces, dots, long and short marks are used for transmitting and recording information by telegraph.

Neither do I confine my invention to the working of the respective slide with its pinion and rack; it may be operated by passing the slide against the shaft or roll—friction producing the same as the rack.

Neither do I confine my invention to the spiral spring, any other may be used.

But I claim the construction of a bank of telegraphic keys, as described, and operated by their respective pinions, or by a roll with or without teeth. said pinions or roll may be operated by clock-work, or by any known motor, and thereby operating the well-known magnetic lever, as set forth, causing the connections of the battery circuit to be completed and broken a succession of times by a single operation of the operator, said connections to be of a longer or shorter duration, as the respective symbol on the respective slide shall indicate, disclaiming any other telegraphic keys, and to other telegraphic operations for the producing of dots and marks.

BEE HIVES—Henry Eddy, of North Bridgewater, Mass.: I claim nothing original in dividing the hive into upper and lower apartments nor the insertion of panes of glass in the sides of such apartments.

I claim the arrangement of metallic protectors in a movable slide or bottom, as set forth.

MAKING SLAG WARE—Wm. G. Elliott, of Blisworth, Eng. Patented in England, Oct. 5, 1852: I do not claim as of my invention piercing rods, presses, stampers, rollers and molds for hollow and pierced bricks, pipes, or other articles of any other shape or form; nor annealing ovens nor furnaces, nor pressing of slags or like material into forms or molds, except when such operation is combined with piercing the material in the manner set forth.

But I claim the improvement in the manufacture of bricks, pipes, tiles, and other articles capable of being molded from slag, or from a liquid mass analogous to slag, in a melted or fused state, such improvement consisting in expelling the gases of the slag by piercing and pressure at the same time, when the slag is in a mold.

SAWING MACHINE—Benj. Fulghum, of Richmond, Ind.: I do not claim a saw placed in a reciprocating or traveling carriage, irrespective of the construction and arrangement shown, for they have been previously used.

But I claim sawing timber by placing a saw within a carriage attached to frames jointed or connected together, and operating as described.

PORTABLE STAGING—W. P. Goolman and Saml. Morris, of Springtown, Ind.: We claim, first, conducting the rope which supports the platform, G, to the platform, H. as described, and fastening it thereto, so that the workmen on the platform, G, can traverse both platforms simultaneously in either direction.

Second, connecting the bars of the connecting bridge with hinges, so that they may be folded to use part of its length, or so as to occupy a shorter space in transporting from place to place.

Third, the additional links, so constructed, arranged, and connected with the other links, as to sustain and support the bars or rails of the bridge when the bars are swung round to shorten said bridge, as described.

VAULT LIGHTS—Thaddeus Hyatt, of New York City: I claim the making a vault cover by the union of two metal pieces, of which one is formed as a grating, and the other is formed with an opening whose area is at least equal to the combined area of all the openings in the grating: the area of the one being covered over by the grate bars of the other, in combination with a glass or layers of glass protected by the grating, and covering the opening of the metal frame in which they are set, as described.

AIR ENGINES—Jas. R. Napier, of Glasgow, and Wm. J. M. Rankine, of the Parish of Govan, Great Britain. Patented in England June 9, 1853: We make no claim to any of the mechanical parts separately.

But we claim as the improvements which constitute the peculiarity of the engine, in the first place, the invention and adaptation of what we have called a heat screen, the form of which may be varied, and the means of giving motion thereto may also be varied, the said heat screen being separate and distinct from the plunger, which drives the air or other gas from the hot to the cold end of the receiver, and vice versa, and being adapted to the following purposes:

First, to screen the principal portions of the air, or other gas from the communication of heat from the furnace or source of heat at those times when that heat would impede the motion of the engine, that is to say, when the air or other gas is being passed towards the cold end of the receiver to be cooled when it is not being expanded, and when it is being compressed.

Second, to receive and store up in its own material at such times the heat communicated from the furnace.

Third, to permit and accelerate the communication of heat to the air or other gas at the time when it is most effective in developing mechanical power, that is to say, when the air or other gas is being expanded.

In the second place, we claim the adaption of tubular receivers for the purpose of heating and cooling the air or other gas in the manner described, that is to say, by the aid of rod-shaped heat screens or plungers nearly filling the tubes, and serving by being moved out and in, whether by the mechanism shown or by any other suitable mechanism, to admit and expel the air or other gas, and promote its circulation over the heated or cooled surface.

We do not however claim the invention of tubes as a means of increasing heat-conducting surface, but simply the adaptation of tubes to engines worked by the action of heat on air or other gas, by the aid of the rod-shaped heat screens or plungers described.

TIDAL OR CURRENT HYDRAULIC RAM—John W. Middleton, of Philadelphia, Pa.: I claim the combination of a weighted lever or float with a series of narrow strips, each hinged at or near its middle, so that the pressure of the water above and below the hinge may be nearly equal, these strips being arranged across the lower end of the tube, to close and open it alternately, substantially as specified.

I also claim the arrangement of the strips in a curve and turning them in the act of opening, different distances to keep them parallel to each other, as shown, thereby permitting the water to flow more freely, as set forth.

FIRE ARMS—Wm. H. Morrison, of the County of Marion, Ind.: I claim, first, the arrangement of the turning lever, and the manner in which it is made to turn the revolving cylinder, and of the plate behind the cylinder on which the turning lever operates, as described.

Second, The arrangement and combination of the levers by which the catch (that arrests the revolution of the cylinder) is operated on, and the manner in which these levers are worked by the turning lever, as described.

Third, The arrangements, substantially as described, by which the revolving cylinder is thrown out to the side, so as to clear the barrel in loading without detaching the former from the gun.

Fourth. The use of the cutter at the bottom of the bore of the barrel, for opening the cartridges as described.

And I claim the use of such a cutter, whether of the particular shape described or not.

CONVERTING THE BACKS OF CAR SEATS INTO BEDS OR LOUNGES—H. B. Myer, of Buffalo, N. Y.: I claim the construction or formation of beds or lounges on the backs of railroad car seats by turning them up to and retaining them in a horizontal position, and so arranging the backs of contiguous seats that they may meet and remain in the same horizontal plane by the methods herein described, or by any other substantially the same, and which will answer the intended purpose.

BREECH-LOADING FIRE ARMS—Abner N. Newton, of Richmond, Ind.: I claim, first, Constructing the breech with a hinged lip, as described, which fits to a recess in the chamber and receives the charge when the breech is drawn back, but forms part of the chamber when the breech is in place for firing, and which, when the breech is moving back and forth is capable of a slight vibration to compensate for any want of truth in the breech or its fittings, and to enable itself to rise from the floor of the recess in the chamber, to be supported by a friction roller in running back and forth, but to bed firmly on the floor of the recess when the breech is in place for firing, as set forth.

Second, The method as described of operating the clamps to lock and unlock the breech by means of the crossed or shears levers, the double slotted lever, the plate or broad arm on the transverse shaft, all constructed, arranged, and operating as set forth.

Third, Moving the breech back and forth by means of arms attached to the same shaft, which is the first mover of the mechanism which actuates the clamps to lock and unlock the breech, the said arms entering recesses in the sides of the breech, as herein set forth.

Fourth, The attachment of the hammer main spring, tumbler and feather spring, or all that combination of parts constituting the lock of the gun to the movable breech, or to the same carriage therewith in any way substantially as described, whereby the movement of the breech is made to effect the cocking and setting free of the hammer to explode the charge.

Fifth, So constructing the inclined way on the gun carriage which actuates the arm of the lock in cocking the hammer, that if the hammer escapes it will be prevented by the arm coming in contact with the said way, from striking the needle or its equivalent, which explodes the charge until the breech pin has entered the chamber of the gun, as described.

ROSIN OIL LAMPS—Isaac Pitman, of Reading, Mass.: I do not claim the use of the ventilating ring to regulate the inner current of air of the burner, as claimed by Harvey Tomblinson in his patent of September 1st, 1843, it being in my lamp of very little, if any, practical value.

I claim the regulation of the outer current of air of the burner by means of a sliding ring or by substantially like means, the same in combination with the vertically stationary and constantly and unvaryingly exposed wick setting snugly between two tubes of unequal hight, as described and set forth.

WATER METER—Marvin Smith, of New Haven, Conn.: I claim, first, Constructing the piston with cells, and arranged in any way substantially as described, to communicate with the inlet and outlet pipes of the cylinder, so that by a slight movement of the piston on its axis the communications of the upper and lower parts of the cylinder with the inlet and outlet pipes, may be reversed, as set forth.

Second, The combination of the tongue on the piston rod, the vertical fixed guide, and the connected weighted levers, all operating as described, for the purpose of moving the piston on its axis at the end of every stroke and thereby reversing the communication of the inlet and outlet.

COUNTING MACHINES, AND MACHINES FOR INDICATING MOTION—W. G. Sterling, of Bridgeport, Conn.: I do not claim the revolution of a ring by means of cogs working in a screw or spiral, commonly termed a tangent screw.

But I claim the combinaiton of the revolving endless screw marked with figures on its surface, as above described, with the stationary toothed nut with a female screw in its center, fitting the screw on the revolving ring in the manner set forth for the purpose of causing the revolution of said ring, as specified.

PUMPS—John Tapley, of Frankfort, Me.: I claim the arrangement of two cylinders in a line with each other connected by a frame and fitted with valves, stuffing boxes, and a tubular plunger, which works in both, and has a valve arranged in its middle, as described, the plunger and each of the cylinders being made in two pieces at the junction of which a valve is secured, so that, without separating the cylinder and plunger, or dismounting either of them, any one of the valves, or the packing of the plungers can with facility be adjusted, removed, or replaced.

SAFETY WASHER FOR SECURING WHEELS TO AXLES—Wm. Thornley, of Philadelphia, Pa.: I claim a washer having a projecting flange and stop or stops, also the cap with the stop or stops as described, for the purpose specified.

SAUSAGE STUFFERS—John J. Weeks, of Buckram, N. Y.: I claim the arrangement of the adjustable shaping and protecting tube in combination with the filling tube, as described.

SAWING FIRE WOOD &c.—Archibald Winter, of Rondout, N. Y.: I claim the employment or use of the endless chains provided with hooks, and arranged with a circular saw, one or more, substantially as herein shown, and for the purpose as specified.

[This invention is illustrated in No. 50, Vol. 9, SCIENTIFIC AMERICAN.]

OPERATING GUIDE ROLLERS AND FEED CLAMPS IN SAWING MACHINES—Loren J. Wicks, of New York, N. Y.: I do not claim the form of the feeding clamps, nor operating them by an eccentric, for they have been previously used and operated as herein shown. Neither do I claim the guide rollers, for they are in common use.

But I claim connecting the two clamps of each pair together by means of the racks and pinions, as shown, one clamp of each pair being made adjustable and connecting the guide rollers together by means of the segment racks and pinions, the rollers, racks, and pinions being secured or attached to a movable or jointed frame, as shown.

POLISHING DAGUERREOTYPE PLATES—B. F. Upton, of Bath, Me.: I claim the combination and arrangement of mechanism for supporting the polishing board, maintaining it constantly in one plane, and imparting to it a reciprocating motion, the said combination consisting of the two rocker sectors, the two sets of forward and back draft belts, the connecting rod and crank applied and made to operate together essentially as specified.

GRAIN AND GRASS HARVESTERS—Abner Whiteley, of Springfield, Ohio: I claim the reel having on one of its blades a swinging or suspended rake, whose ends pass between and are combined with ways or guides, for the purpose of not only delivering the grain at the rear of the platform, but also better directing the standing crop to the cutters, as set forth.

I claim the latch with appendages for the purpose of making the rake gather more or less grain, as set forth.

I also claim placing the vibrating knife bar and cutters thereon between alternately placed fingers for the purpose of dispensing with the slot guards, and sustaining the line of cut by throwing the action of the alternate shear edge of the blade of said cutters on the upper and lower sides of the fingers.

CALENDER CLOCKS—Wm. H. Akins, and J. C. Burrett, of Ithica, N. Y., assignors to Wm. H. Akins, of Ithica, aforesaid: We claim, first, The arrangement of the four rows of teeth on wheel L, in combination with the corrugated plate, the detent, and the arm, the rocking shaft, and the slotted arm, or the equivalent of said arms and rocking shaft, and for the purposes set forth.

Second, Raising the clicks over four or more of the teeth of the wheel (when run down) on the first day of the month, thereby acquiring a retaining power, sufficient to be used in the short months, thus moving the wheel, L, carrying the hand, I, on the dial from the 28th day of February, past the 29th, 30th, and 31st divisions of the wheel, L, to the figure 1, or the first day of March: those teeth (the 29th, 30th, and 31st.) being removed, the detent stopping the wheel, L, at the point marked 1, on figure 8, indicating the first day of every month—one tooth only being used, except at the last day of a short month, the rod 30 slipping through the end of the lever, Y.

Third, We also claim the combination of the helix, V, the lever, Y. lifting rod 30, the detent, X, the pin 55, the click 37, the wheel L, and spring 7, and for the purposes described, that is, giving movement to the wheel L, the rollers, F, G, and H, being moved by similar devices.

GOLD SEPARATOR—E. L. Seymour, (assignor to D. B. Brown,) of New York City: I claim in the construction of receptacles or vessels for containing auriferous and other ores, earths, etc., to be treated or separated by water or air, as above described, making the said receptacle or vessel of two, three, or more sections, arranged one above another, perpendicularly, so that they may be slid off in succession in a horizontal direction, or otherwise removed, to remove the refuse matter separated from the metal in the first or top section, and the several or other layers of stratified matter contained in the other sections, according to their respective specific gravities.

CALENDER CLOCKS—John Williams, (assignor to F. Curtis & Co.) of Hartford, Conn.: I claim the wheel, C, carried by the wheel, E. and combined with the lever, O, and its stop, 23. and the pin upon the wheel. B, to engage the lever, O, the said wheel, C, having on its periphery forty-eight cogs or teeth, each cog or tooth representing a month, and having upon its upper face three pins, 20, and a fourth pin, 21; the three pins, 20, making the month of February for three successive years; and the fourth pin, 21, the leap year; also the pins, 19, to mark the months of thirty days, the whole operating for the purpose described.

NOTE—Eight of the patents of the above list (making one third of the whole) were secured through the "Scientific American Patent Agency." Our arrangements are now perfected which will enable us to dispatch as much business as inventive genius can supply. Inventors can correspond with us freely upon all matters pertaining to applications for patents, and circulars of information are sent gratis.

### Recent Foreign Inventions.

SELF-SUSTAINING POWER.—It is really surprising to us, that with all the light which has been thrown on this subject by all the scientific periodicals, whose editors are acquainted with mechanical philosophy, that there should exist a single individual into whose mind the truth has not yet penetrated. It is really so, however, as we perceive that a patent has recently been taken out in England by A. W. Sleigh, of London, entitled "Creating a continual self-acting, self-sustaining new motive power, applicable to every purpose requiring speed and motion." This wonderful power, he asserts, created "by the action and operation of a consecutive juxta-hydrostatic valve or valves accomplishing the automatical displacement of liquids within its limits of action, thus throwing an effective preponderance of alternate or continual hydrostatic pressure on any required side of a chamber or cylinder, and thus producing a continual self-sustaining motive power." The difficulty with this invention is that it is not, nor never can be, a self-sustaining power. It is a curious fact that two years ago we received communications from a correspondent relating to a supposed invention of the same nature exactly as the above. By our advice he saved his money by not applying, as he wished to do, for a patent. If Mr. S. had such a source to apply for information in London, unless he was too self-willed, he might have saved himself some money and trouble, as his reputed invention is not worth a straw.

SEWAGE MANURE.—Thomas Wicksteed, of Leicester, England, has secured a patent for making sewage manure, by mixing charcoal reduced to fine powder with milk of lime, of the thickness of cream, and then causing this mixture to flow into a stream of the sewage water by means of pumps. It appears to us that much of the sewage deposits in this city could be converted into excellent manure and sold with great profit. A company organized to manufacture a fertilizing material would save a great deal to our country every year; and it would also save this city an immense sum, by preventing the sewage mud from filling up our docks. Or let them operate on the sewage mud of our docks and save the city the expense of dredging.

ELECTRIC SPIRITUAL TELEGRAPH—Many of our readers will remember a paragraph which had quite an extensive circulation, respecting a machine invented for indicating a person's thoughts by electricity. There was no joke in the matter; such a machine was constructed and a patent applied for in England, but the complete specification has not been proceeded with; the author of it was A. T. Wagner, of Berlin, Prussia,—the father, we believe, of Madam Wagner, the famous vocalist. The reason of this inventor for abandoning his project may be the great abundance of cheap mediums which have sprung up during the past year.

### Subterranean Waters.

We recently noticed a very deep artesian well which has been bored at the sugar works of Belcher & Brothers, St. Louis, Mo., to the depth of twenty-two hundred feet without reaching pure water. This is the greatest depth ever attained, and as the operation of boring is still continued, in the confident hope of ultimately securing the long-sought water, the question is undergoing a scientific discussion as to whether this expectation is not fallacious. A writer in the St. Louis *Democrat* who has conversed with the operators, makes the following representation of the probable ultimate result. He takes it for granted that water will be reached.

"Suppose that the vein may have its foundation head (and there is no extravagance in the hypothesis) somewhere in the peaks of the Rocky Mountains at the altitude of one thousand feet, and by a dip of the strata of rocks between which it is contained, it lies twenty-five hundred feet below the surface of the ground at this point of the earth's surface, then on the principle that water must find its level, or that the stream will rise as high as the fountain, the water will burst forth with a force sufficient to carry it to the hight of a thousand feet, excepting, of course, the diminished force that would be induced by the friction of the stream against the sides of the bore—though still the great pressure of the earth at the depth of twenty-five hundred feet would equal, or, perhaps, more than counterbalance the impediment of friction."

The Washington *Globe*, commenting upon this, seems to augur a failure, and says:—

"The reason of the failures is, in general, the adoption of an erroneous theory, which is the popular one, but is not the correct one, notwithstanding—that water can be had anywhere, invariably, by boring deep enough.—We believe this is a fallacy, and that, were it possible to bore to the center of the earth, it might be done in some localities, without obtaining the desired element."

A similar conclusion has been arrived at by Mr. Robert Mills, the architect and engineer, who, in a communication to the *National Intelligencer*, remarks:

"The *sulphur water* is probably the only *running stream* that will be met with; as it flows from the caverns of the mountains, formed by the action of internal fires, evidence of which is observable in these mountains."

In 1849, Mr Mills published some papers in the *Intelligencer*, in the course of which he asserted that the artesian well at Charleston would not reach a permanent supply of pure water, as that city is located on an alluvial region where no primitive springs can be reached or tapped; and this has been verified so far, no sufficient supply of water having yet been reached.

© 1854 SCIENTIFIC AMERICAN, INC.

## TO CORRESPONDENTS.

A. H., of Ill.—Your improvement in doors for preventing rain from beating into dwellings, is different from the devices known as "weather strips," for which thereare several patents, and we think yours contains a patentable feature. You had better send us a model of it.

R. E. A., of Ct.—We have published this paper for nine years to no purpose if such absurd theories as you lift up against our views are worthy the serious attention of practically scientific minds. We do not care what this or that professor says, we know better, and no elaborate mathematical demonstrations can gain the advantages of what is true.

J. H., Jr., of Canada—You ask if a British subject can assign his invention to a citizen of the United States, and thereby procure a patent by paying $30. We answer, he cannot—the fee would be five hundred dollars. There is no way to avoid this unless the foreign inventor resides here one year next preceeding his application for a patent, and makes oath of his intention to become a citizen. The sale of machines does not affect the legality of a patent for a space of two years, still it is not safe to delay the application after the invention is complete.

W. R. O., of La.—Your improvement in the manufacture of sugar appears to be both new and useful, and we would advise you to send us a model of it.

W. L., of Md.—You can consult us in reference to your invention.

E. S. R., of La.—We cannot give you any information about the agencies of Messrs. Wethered for their super-heating steam patent, but shall illustrate the invention very soon in our paper.

C. P. S., of Oregon—We will try and get the proper information about purifying salt; if obtained, you will see it in the columns of SCIENTIFIC AMERICAN.

B. H. G. H., of Cal.—Until some new discovery of a lighter gas is made, or a more compact power than steam, there is no hope of propelling balloons through the air economically.

J. H. B., of Mich.—Some of the liquor used for steaming the shingle wood may be used in the boiler, but if it is very strong, it might, as you say, corrode the iron.

S. G. C., of Pa.—We have seen boilers arranged something like those in your sketch, but you must remember that the weight of the upper boiler on the lower one is not small. You should put in at least ten or fifteen tubes, instead of three. You intend to have water in the upper boiler also, we suppose.

J. A. R., of N. Y.—Your note concerning your model we forwarded to the Patent Office, accompanying it with suitable remarks, on the 14th inst.

W. F., of Mass.—Mr. Barrows' steamboat, in this city, is propelled by a rotary engine secured to the paddle wheel shaft. You will see our opinion in the last number of the SCIENTIFIC AMERICAN, respecting compressed air as a motive agent. We would advise you not to spend your time and talents on the subject.

G. W. H.. of N. Y.—We do not recollect about the chimney top for furnaces, to prevent sparks setting fire to the roof. The only plan that we know of is to have a spark catcher on the top, but as this would partly arrest the draft, it may not be proper to put it on. The best plan for safety is to have a high chimney and fire-proof roofs.

M. H., of Geo.—At present we cannot give you the information about soldering sheet lead to the iron kettle, but if we obtain the same it will appear in our columns as a recipe

J. B., of Florida—The work on the steam Engine, by the Artisan Club, is a very good one. It is for sale by Appleton & Co., this city. The price is $8, we think.

J. H., of Ill.—Yours has been received.

H. C., of Florida—Yours will be noticed next week.

S. S., of Mass.—Soluble glass is made by fusing one part of quartz with two parts of crystalized soda. The product dissolves in hot water.

R. T. H., of Va.—Yours will be attended to.

A. C. A., of Ct.—We do not regard your device for "generating power itself" as possessing any practicable feature. The thing cannot be done, you may depend upon it.

M. H. R., of Tenn.—You have been anticipated in your boring machine. One embracing its essential characteristics is published in Vol. 6 SCIENTIFIC AMERICAN. You are advised not to make an application.

---

Money received on account of Patent Office business for the week ending Saturday, Sept. 23:—

G. P. F., of Mich., $30; W. G. H., of Pa., $55; S. P. P., of N. J., $50; J. B. H., of N. Y., $10; H. H. O., of Ct., $30; J. J. H., of Mass., $30; H. C., of N. Y., $30; W. H. A., of Wis. $15; W. W., of N. Y., $29 13 cts.; C. & R., of Mo., $30; O. S., of La., $30; G. T., of N. Y., $30; G. T., of N. J., $30; H. D., of Ct., $20; W. G., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 23:—

S. P. M., of Vt; W. G., of N. Y.; W. H. A., of Wis.; W. H. B., of N. Y.; H. B., of Ind.; S, B., of N. Y.; H. D., of Ct.

## Important Items.

PATENT LAWS, AND GUIDE TO INVENTORS—We publish and have for sale, the Patent Laws of the United States—the pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office. Price 12½ cents per copy.

BINDING—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

FOREIGN SUBSCRIBERS—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the present volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

BACK NUMBERS AND VOLUMES—We have the following numbers and volumes of the SCIENTIFIC AMERICAN, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75. Subscribers who have missed numbers on she Volume juit closed, can be supplied with copies to fill the vacancy, excepting the following numbers: 1, 6, 9, 11, 22, and 23.

RECEIPTS—When money is paid at the office for subscriptions a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgement of the receipt of their funds.

### Terms of Advertising.

| | | |
|---|---|---|
| 4 lines, for each insertion, | | $1,00 |
| 8 " | " " | 2,00 |
| 12 " | " " | 3,00 |
| 16 " | " " | 4,00 |

Advertisements exceeding 16 lines cannot be admitted, neither can engravings be inserted in the advertising columns at any price.

☞ All advertisements must be paid for before inserting.


**COTTON MANUFACTURING** Establishment for Sale. The main building is 71 x 42 ft., 4 1-2 stories high, built of stone and brick, slate roof. Wing 60 x 20 ft., 3 stories high, stone and brick, slate roof. Engine house, 50 x 32 ft., stone and brick. Cotton house, 70 x 20 ft. Two Engines, 4 ft. stroke, 5 cylinder boilers. It embraces all the necessary machinery for carrying on the business, such as Throstles, Cards, Strippers, Beaters, Pickers, Spoolers, Beamer Tools, etc. Most new and in good order. For circulars of information, or any particulars, apply to E. H. MOORE or J. C. PERRY, Wellsburg, Va. The location is, in every respect, one of the most desirable in the West. 1*

**WANTED**—The Advertisers wish to obtain the partial services of some person who is traveling among mechanics to sell an article they are manufacturing. Good references given and required. Address box 107 P. O., Providence, R. I. 1*

**ESTABLISHED IN 1796**—Philosophical, Mathematical and Optical Instruments. Our priced and illustrated Catalogue furnished on application, and sent by mail free of charge. McALLISTER & BROTHER, Opticians, 48 Chesnut st., Philadelphia. 3 6

**MACHINIST'S TOOLS**—Now finished, two Engine Lathes, 9½ feet bed, 18 inches swing; one do. with screw cutting apparatus; also, one 7½ feet bed, 18 inch swing; and two do. with screw, from new and improved patterns and of superior workmanship, by C. S. TOLMAN & CO., Fitchburg, Mass. 3 2eow

**ENGINEERS, DRAUGHTSMEN, AND MECHANICS** supplied with Drawing Instruments, separate and in cases, Parallel Rules, Scales, Dividers, Metallic Tape Measures, Linen do., Chains, Surveyors' Compasses, Levels and Transits, and a large assortment of Optical and Mathematical Instruments, wholesale and retail by JAS. W. QUEEN, of the late firm of McAllister & Co., 264 Chesnut st., Philadelphia. Illustrated catalogues gratis by mail. 3 3m

**CHEAP ENOUGH**—Stearns & Co.'s Mammoth Catalogue of Books and Prints will be sent gratis, and pre-paid, to all who may apply for it before the 1st of January, 1855. Send along your names and those of your friends, gentlemen. Address STEARNS & CO., 163 Fulton st., N. Y. 3 2

**THE SCIENTIFIC STAIR BUILDER** by Robert Riddell; atlas quarto. Illustrated with forty plates. Price $5—This is a work that should be in the hands of every architect builder, and mechanic. The author having stripped the subject of all mystery and unnecessary lines, so that an ordinary workman can accomplish with ease and certainty, the most difficult and intricate description of stairs. It embraces the greatest amount of useful and original matter that has ever been published on this branch of art for which the author's well established reputation is a sufficient guarantee. The utmost care has been taken to arrange the practical diagrams, in order that they may meet the wants of those who have little or no experience in this art, and to furnish the most simple and comprehensive methods of attaining the object in view. Stone-cutters, masons, and all connected with building, are interested in this valuable book. John E. Carver, Architect, 51 Sixth street, Philadelphia, is the principal agent for the United States. All orders must be accompanied with the money. Single copies $5. The work may also be had at all the principal book stores in the large cities of the United States. 2 4

**MILLWRIGHT AND MACHINE WORK**—The subscriber keeps on hand and manufactures to order, Steam Engines of the following sizes, 3, 4½, 6, 8, 10, 12, 15, 18, 20, 25, 30, 40, and 50 horse power. These Engines are of the simplest, most economical, and substantial construction, and will be sold at the lowest possible terms. Also Saw Mills and Saw Mill Machinery of every description. Shafting, Gearing, &c., laid out and put up in the most approved and workmanlike manner. THOS. J. WELLS, Twenty-ninth Street and Eleventh Avenue. 2 2*

**TO MACHINISTS**—Wanted, for immediate use, a Planing and Grooving Machine, with a circular saw to be worked from a drum in an adjoining mill, with a power faom 5 to 10 horse. Apply to WINSLOW & LAWRENCE. No. 4 Jones' Lane, Front st., N. Y. 2 2*

**NEW HAVEN MANUFACTURING COMPANY** Machinists' Tools. Iron planers and Engine Lathes of all sizes. Hand Lathes, Gear Cutters, Drills, Bolt Cutters, Chucks, &c., on hand and being built by the quantity, which enables us to sell low. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven, Conn. 1 tf

**PATENT DRIERS**—Zinc Driers, Graining Colors, Stove Polish, Gold Size, &c., &c., 114 John street, New York. QUARTERMAN & SON, Manufacturers. 1 6m

**CHEAPEST AND BEST**—The New York Weekly Sun is to be sent to subscribers after Oct. 1st, at 75 cents a year, ($1 pays for 16 months,) three copies for $2, or 25 copies for $15. and $100 cash premiums is to be divided among those who send in the most subscribers between Sept. 15th and Feb. 3rd, 1855. Specimen copies gratis. Address, (post-paid,) MOSES S. BEACH, Sun Office, New York. 1 tf

**STAVE AND BARREL MACHINERY**—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 1 tf

**RENSSELEAR POLYTECHNIC INSTITUTE**—Designed for the education of Architects and Civil Engineers, including Railway, Hydraulic, Topographical, and Mining Engineers. For copies of the Annual Register, giving full information respecting the Institute, apply to B. FRANKLIN GREEN, Director, etc., R. P. I., Troy, N. Y. 1 8

**TO IRON FOUNDERS**—Scotch and American Pig Iron. English Sheet Iron and Boiler Plates. Fire Bricks, Clay and Sand, and all kinds of Iron Founders' Facing Materials for sale by G. O. ROBERTSON, 135 Water street, (corner of Pine) New York. 1 6*

**A. B. ELY**, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

**HARRISON'S GRAIN MILLS**—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 1 tf


UNITED STATES PATENT OFFICE,
Washington, August 18, 1854.

**ON THE PETITION** of Solomon Andrews, of Perth Amboy, New Jersey, praying for the extension of a patent granted to him on the 5th of December, 1840, for an improvement in the "manner of constructing padlocks for mail bags and other uses, called the clam-shell padlock," for seven years from the expiration of said patent, which takes place on the 5th day of December, 1854:

It is ordered that the said petition be heard at the Patent Office on Monday, the 11th of November next, at 12 o'clock M., and all persons are notified to appear and show cause if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days from the day of hearing. All testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the Office, which will be furnished on application.

The testimony in the case will be closed on the 3d of November; depositions and other papers relied upon as testimony must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered also, that this notice be published in the Union Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Penn.; Scientific American, New York; and Post, Boston, Mass., once a week, for three successive weeks previous to the 13th day of November next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S. Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 2 3

UNITED STATES PATENT OFFICE,
Washington, August 18, 1854.

**ON THE PETITION** of Jordon L. Mott, of Mott Haven, praying for the extension of a patent granted to him on the 1st day of December, 1840, for an improvement in "the mode of constructing a combined cauldron and furnace for the use of agriculturists and others," for seven years from the expiration of said patent, which takes place on the first day of December, 1854:

It is ordered that the said petition be heard at the Patent Office on Monday, the 6th day of November next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 31st day of October, 1854; depositions and other papers relied upon as testimony must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Evening Argus, Philadelphia, Penn.; Scientific American, N. Y.; and Post, Boston, Mass., once a week for three successive weeks previous to the 6th of November next, the day of hearing. CHARLES MASON,
Commissioner of Patents.

P. S. Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 1 3

UNITED STATES PATENT OFFICE,
Washington, Sept. 6, 1854.

**ON THE PETITION** of Henry Burden, of Troy, New York, praying for the extension of a patent granted to them on the 10th day of December, 1840, for an improvement in "machine for rolling puddle balls or other masses of iron, in the manufacture of iron, for seven years from the expiration of said patent, which takes place on the 10th day of December, 1854.

It is ordered that the said petition be heard at the Patent Office, on Monday, the 27th of November next, at 12 o'clock. M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing: all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 17th of November; depositions and other papers relied on as testimony, must be in the office on or before the morning of that day, the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.: Evening Argus, Philadelphia, Pa.: Scientific American, New York, and Post, Boston, Massachusetts, once a week for three successive weeks previous to the 27th day of November next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 53 3


**MAGIC LANTERNS AND DISSOLVING** Views for Sunday Schools, Academies, and Public Exhibitions, with Scriptural, Astronomical, Temperance and other Paintings A priced and illustrated Catalogue of Lanterns and Slides sent by Mail, free of charge.
McALLISTER & BROTHERS,
1 3. 48 Chestnut Street, Opticians, Philadelphia.

**NORTHVILLE MACHINE WORKS**—Manufactory of Machinists Tools, consisting of Engine Lathes, Power Planers, Hand Lathes, Engine Lathe for turning chair stuff, all of the most improved patterns and quality of workmanship. Worcester, Northville, Mass.. August 9, 1854. TAFT & GLEASON. 50 1y*

**NEW PATENT FLOUR AND GRAIN MILL**—Patented June 6th, 1854. The subscriber is finishing the following mills: 8 twenty inch, price $100; 6 thirty inch, $200; 3 three feet, $300; 2 four feet, $400, and will pay $1,000 for any other mill as durable, simple, economical of power, which will grind as much from one dressing, which will heat the flour and meal as little, and is as easily kept in order. Cuts sent to post-paid applications, and liberal commissions allowed to agents for cash orders. EDWARD HARRISON, New Haven, Conn., July 24th. sole owner of all interest in the patent right. 50 9*

**JOHN PARSHLEY**, manufaeturer of machinist's tools, No. 5 and 7 Howard street, New Haven, Ct., is now finishing a lot of iron planers to plane 8 5-12 feet long, 30 in. wide, and 26 in. high, having the down and angle feed in the cross head, the planers all of the best quality, and prices extremely low for the quality. Cuts with full particulars can be had by addressing as above, post-paid. 1 tf

**MACHINISTS' TOOLS**—The subscribers would respectfully call the attention of machinists and engineers to their Patent Improved Tool Rest for Engine Lathes, they are now prepared to receive orders for Engine Lathes with this improvement, and will spare no pains nor expense to make their machines a first rate article in every respect. Novelty Iron Works, Boston, Mass. W. W. NICHOLS & CO. 1 4 eow

**STEAM ENGINE**—80 Horse Power, for sale by the Lawrence Machine Shop. It is now driving the machinery in the Crystal Palace, and can be delivered the 1st of Nov., 1854. Apply to Gordon McKay, Treasurer, office 51 Broad street, New York, 47 State street, Boston; J. C. Hoadly, Superintendent, Office in Lawrence, Mass. or David A. Clary, Selling Agent, Office at the Machinery Depot of the Lawrence Machine Shop. The Lawrence Machine Shop have now on hand Locomotives, Steam Engines, all kinds of Machinists' Tools, large Lathes (finished) for Locomotive Drivers and Planing Machines—that plane 3 feet square by 12 feet. Parker and Turbine Water Wheels, Wool Cards and Jacks, Shafting and Pulleys, &c., promptly made to order. A superior article fo Oak Tanned Sewed Leather Belting constantly on hand. Inquire as above. 1 4*

**IRVING'S PATENT SAFETY CIRCULATING** STEAM BOILER—For Stationary, Locomotive, and Marine Engines. These Boilers having been thoroughly tested by scientific experiment and practical use, are being rapidly introduced into every part of the United States. Their claims to superiority are fully supported by the united testimony of highly respectable parties, who have given them the most successful trials. The following are among the chief advantages of this Boiler: 1st. Great increase of heating surface, with diminution of bulk. 2nd, Economy of fuel—a saving of more than 50 per cent. being effected over other boilers. 3rd. Economy of space, compactness, and strength of form. 4th. Increased safety from explosion. 5th. Freedom from incrustation. Circulars obtained on application at the Company's Office. Boilers of any required power furnished on short notice. Rights negotiated for all parts of the United Staies, England, France, and Belgium.—All communications promptly attended to.
W. F. PHELPS,
45 3m* Sec'y Irving S. Boiler Co., 347 Broadway, N. Y.

**KENTUCKY LOCOMOTIVE WORKS**—Corner of Kentucky and Tenth streets, Louisville, Ky.—The proprietors of the Kentucky Locomotive Works would respectfully inform Railroad Companies and the public generally, that, having completed their establishment, they are now prepared to receive and execute orders with fidelity and dispatch. They will contract for Locomotives, Passenger, Baggage, Freight, Gravel, and Hand Cars, of every style and pattern, as well as all kinds of Stock and Machinery required for railroads.—Particular attention will be paid to Repairing, for which they have every facility. They are also prepared to contract on favorable terms for building all kinds of Machine Tools, such as Turning Engines, Laths, Planers, Drills, Slotting, Splining, and Shaping Machines of every variety of pattern. Having also a large Foundry connected with the establishment, orders for castings are solicited, and will be filled with promptness. Car Wheels of any pattern can be furnished on short notice. Double and single plate and Spoke Wheels of all sizes constantly on hand. Communications or orders must be addressed to OLMSTED, TENNEYS & PECK, Louisville, Ky. 40 6m*

**MECHANICAL ENGINEERING**—CHARLES EHMAN & CO., Consulting Engineers and Designers, 333 Broadway, New York. Designs, Working Drawings, estimates and contracts for high or low pressure steam engines (Ehman's improved vertical engine) Boilers, Pumps, Presses, Saw and Grist Mills, Tools and Machinery of every description. Particular attention paid to making drawings and working plans for inventions and models, to the construction of patent machines, etc., etc, Arrangements made, and plans furnished for putting up and locating Engines, Boilers, Shaftings, and all kinds of machinery in buildings, etc., etc. 51 8*

**REYNOLD'S DIRECT ACTION** and Re-Action Water Wheel—This is one of the most simple, cheap, and efficient Iron Water Wheels now in use. For description, cuts, &c., apply to SAML. B. LEACH, Agent, 60 Beaver st., N. Y. 45 13*

**FOR GREASING MACHINERY**—For all purposes of lubrication, "Metallic Oil" has many recommendations. Its tendency to remain on a smooth surface of metal, instead of running off or evaporating, its property of resisting heat and keeping the bearings of machinery cool, and its freeness from "gum," are important considerations with engineers and machinists. A fair trial will convince any unprejudiced person that it is a very valuable substitute for sperm oil.
For sale in quantities to suit purchasers by
YOCKNEY & CO.,
Sole Manufacturers of Cumberland Brothers' Patent "Metallic Oil," Elizabethport, N. J., office 67 Exchange Place, N. Y. 45 12*

**READING'S PATENT CORN SHELLER** and Cleaner—capacity 200 bushels per hour. 9 first premiums awarded in the Fall of 1853. Patent Rights and Machines now for sale at the corner of 2nd Street and Pennsylvania Avenue, Washington, D. C. I challenge the world to produce its equal. Address personally or by mail. WILLIAM READING. 43 13*

**THE EUROPEAN MINING JOURNAL**, Railway and Commercial Gazette. A weekly newspaper, forming a complete history of the Commercial and Scientific Progress of Mines and Railways and a carefully collated Synopsis, with numerous Illustrations of all New Inventions and Improvements in Mechanics and Civil Engineering. Office, 26 Fleet Street, London.—Price $6 1-2 per annum. 43

**ENGINEERING**—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc.
CHARLES W. COPELAND,
1 tf Consulting Engineer, 64 Broadway.

**THE MERIDEN MACHINE CO.**—Successors to Oliver Snow & Co., West Meriden, Conn. Have on hand and make to order a great varlety of Lathes, Planers, and other machinists tools of superior quality and finish. Cuts of these tools may be had on application as above, with full particulars. They also manufacture Farnam's Patent Lift and Force Pumps of all sizes. For mines, factories, railroad stations, &c. Having a large and extensive variety of patterns, the accumulation of over 20 years business, and extensive facilities for making light or heavy castings, are prepared to contract for any kind of mill work, mining machinery, &c. New York Office and Sample Room, No. 15 Gold, cor. Platt st. 1 3m*

**PHŒNIX IRON WORKS**—GEO. S. LINCOLN & CO., Hartford, Conn. Manufacturers of Machinists Tools. Are constantly making and have now on hand an assortment of Screw Cutting Engine Lathes, viz.:—No. 1. bed 10 ft. long, swing 20 inch. No. 2. bed 14 ft. long, swing 30 inches. No. 3. bed 16 1-2 ft long, swing 40 inches, with improved bed, cast steel spindles, feed motion carried by a screw, toothed rack for moving tool rest by hand, improved gibb rest and tool stock, stationary and traveling back rest; also manufacturers of Lathes for turning Locomotive Driving Wheels, small Power Planers, Upright Drills, Power Punching Presses, &c. Designs of the tools with further descriptions, will be sent by addressing as above. 1 3m*

**LEONARD & WILSON**—No, 60 Beaver st., and 109 Pearl st., have constantly on hand and for sale a full assortment of Machinists' and Carpenters' Tools, embracing every variety of Engine and Hand Lathes, Iron Planing Machines, Mortising and Tenoning Machines, Wood Planers, &c. Also Leather Belting of all sizes made of the best oak tanned butts, stretched on powerful machines, riveted and cemented. 42 13*

**PALMER'S PATENT LEG**—"The best appliance ever invented." Pamphlets containing the testimonials of the first American and European surgeons, and other information concerning this invention sent gratis to all who apply to PALMER & CO., Springfield, Mass.: or 376 Chesnut st., Philadelphia. 42 13*

**NORCROSS' ROTARY PLANING MACHINE**—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent.
Rights to use N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.
The printed report of the case with the opinion of the Court can be had of Mr. Norcross, at Lowell, or 27 State street, Boston. 36 6m*

**MACHINISTS TOOLS**—SHRIVER & BROS., Cumberland, Md., (on B. and O. Railroad, midway between Baltimore and the Ohio River,) manufacturers of Lathes, Iron Planers, Drills and other machinists tools 50 6m*


© 1854 SCIENTIFIC AMERICAN, INC.

# Science and Art.

**Expansion of Cast-Iron by Successive Heatings.**

In the memoirs of the Industrial Society of Hanover for last year, there are some interesting remarks on this question. The remarkable phenomenon that cast-iron presents on being heated, of not returning back to its original volume, but of continually showing an increase of that volume, and of permanently acquiring an enlarged volume by successive heatings and coolings, had been first observed by Rinsep, in 1829. That chemist found that a cast-iron retort, whose capacity was exactly measured by the quantity of mercury which it could contain, held at first, 9·13 cubic inches; after the first heating and cooling, 9·64 inches; and after three heatings, up to the melting point of silver, 10·16 cubic inches. The cubical expansion ought, therefore, to be 11·28 per cent., which gives 3·76 per cent. nearly of linear expansion.

At subsequent periods different phenomena were observed, more or less confirmatory of this law. The cast-iron bars of grates, where powerful fires were made, were frequently observed to elongate, so as to become jammed tight in their frames, and when these obstructed all further enlargement, the bars became curved or twisted. M. Brix, in his work on the calorific power of the fuels of Prussia, has detailed a few experiments on this subject. By the aid of several measurements, he has shown that the entire permanent elongation increases after each successive heating, but that the amount produced by each heating diminishes the more frequently the bar is heated, until it finally becomes insensible. Thus, a furnace bar 3½ feet long, after being three days exposed to moderate fire, had already acquired a permanent elongation of 3-16 of an inch, or ·446 per cent., at the end of seventeen days, 1·042 per cent.; and after thirty days, 2 per cent., but had not yet reached its maximum. Another bar of the same kind, after a long service, had a permanent elongation of 3 per cent.

If it be remembered that bars, while exposed to the fire, undergo another temporary elongation, we must agree with M. Brix, that an allowance of 4 per cent. of its length should be made in a bar which has not as yet been used, for this cause of elongation. The bars must, of course, be sufficiently long to stand between their supports when cool, but it seems that hitherto sufficient room has not been given for this permanent expansion in laying down new bars.

**The Steam and Ether Engine.**

Two years ago, G. Rennie, engineer, read a paper before the British Association for the Advancement of Science, in which he presented the claims of the French steam and ether engine. That engine consisted of a steam cylinder, the steam in which caused the usual movement of a piston; and after having performed this work, the waste steam was conducted into another cylinder, inclosed in some pipes of which was a quantity of liquid ether. The steam caused the liquid ether to boil, and the vapor, upon being given off, was conducted into another cylinder, and caused the piston to move. The vapor then escaped by a valve into a condenser or refrigerator, where, upon being brought in contact with cold water drawn from the sea, the vapor was again condensed into liquid, and was conveyed back again to the ether cylinder, to be again heated into vapor and employed in the propulsion of the vessel. The report of the Commissioners appointed by the French Government to inquire into the advantages of the machine, showed, in the voyage from Marseilles to Algiers, a saving of 74 per cent. in the consumption of fuel.

Mr. Rennie stated that, in consequence of the success of the trials, the patent rights had been purchased of the inventor, for 2,500,000f., and several large engines were, he believed, in course of construction upon his plan by the French Government.

Mr. Fairbairn, at the same meeting, in reply to some observations made, stated that the best kind of stationary expansive engines in Lancashire consumed about 2¾ lbs. per horse power, but, probably, the consumption of fuel in the marine engines on the Humber was not much less than 10 lbs. per horse power. It was, therefore, most important to consider whether, by the combination of steam and ether, such an immense saving could be effected as that which had been stated by Mr. Rennie.

Now as sufficient time has since elapsed to have fully tested the superiority of this kind of engine, we suppose it has failed to work as economically as the steam engine, or we should have heard of it.—We expressed our opinion of thisengine when so much was said about it in the papers, and we suppose the result has been as we predicted. We really cannot see how the use of an ether cylinder, heated by the exhaust steam, and then condensed by surface application, could work very effectually, as the vacuum must have been very imperfect in both the steam and ether cylinders, and this must have caused the engine to act very sluggishly.

**History of Reaping Machines.—No. 1.**

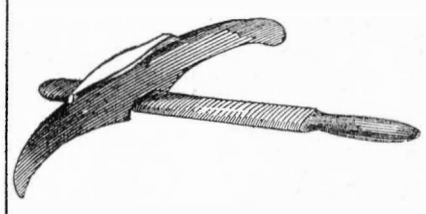
We propose to place before our readers an account of the various methods of gathering grain, grass, etc., from the remotest antiquity to the present day; a description which shall be at once the most authentic, valuable, concise, and interesting that has ever been published.

We trust that our researches will be appreciated by the intelligent farmer and artisan, not only as an interesting branch of mechanical history, but valuable in giving, as fully as possible, the accumulated knowledge of mankind in this important department of industry; and it is to be hoped that the machinist will no longer lose his time, in re-inventing that which is already old, but by comparing known inventions with each other, he will thereby be enabled to suggest new elementary forms of parts, new combinations, and perhaps a better mode of driving the apparatus.

Fig. 1.

The time-honored sickle, still in use, is the earliest known reaping implement,—we find it mentioned, both in the Old and New Testaments; that it was used by hand only, and not a part of a machine, may be inferred from a passage in Isiah xvii. 5; this was obviously the case in Egypt, judging from the bas relief upon some of the buildings and tombs, where reapers are represented using sickles, some with smooth and others with a serrated edge. Two of these ancient Egyptian iron sickles, much rusted, are displayed in the "Gallery of Egyptian Antiquities," in the British Museum, London.

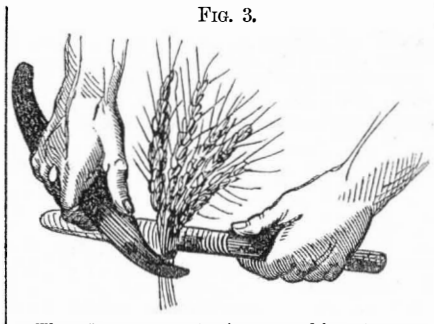
Fig. 2.



In Java an instrument has been in use from time immemorial for reaping grain, which is described in Sir Thomas S. Raffles' History of that Island. The cut here given (fig. 2) is a copy of a drawing of the instrument, as illustrated in the above History.

The description of the *ani ani* being very vague, it is difficult to form a correct opinion of the manner in which it is used, and the figure does not remove the doubt. We surmise, however, that the reaper takes one of the parts in each hand, and in passing them, like the blades of shears, over each other, the straw is cut (as in fig. 3,) and by the same act the head of grain is thrown into a basket or apron worn by the reaper.

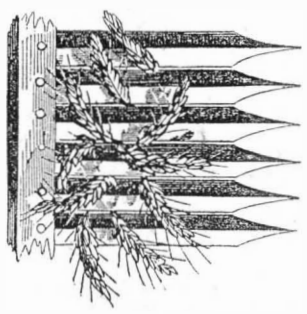
Fig. 3.



The first account of a machine to reap grain appears to be that given by Pliny, the elder, who was born about A. D. 23. He says—"In the extensive fields in the lowlands of Gaul, vans [carts] of large size, with projecting teeth on the edge, are driven on two wheels through the standing grain, by an ox yoked in a reverse position, In this manner the ears are torn off and fall into the van."—[Pliny's Natural History, L. xviii. 72.

Such an idea of a reaping machine is very like that of the ancient war chariots, to the sides of which great blades were fastened, and the horses driven into the ranks of the opposing army, thus to reap a harvest of human heads.

Fig. 4.



As Palladius (an Eastern prelate born A. D. 391) gives a similar account of this machine in the following words, it is more than probable that its use was continued through centuries. After describing the forms of the van and the attachment of the animal, he continues:—"All the ears are caught by the teeth, (like those of figure 4, curved upwards) and fall in a heap into the cart, the broken stalks being left behind. The driver, who follows, generally regulates the elevation or depression of the teeth, and thus by a few courses forwards and backwards, the whole crop is gathered in the space of a few hours. This system is useful in open level places, and in those where straw is not absolutely wanted."—[Palladius Lib. vii., Tit. 2.

When this machine fell into disuse is not recorded, but until a comparatively recent period, no authentic account of any other plan of mechanical reaping has been found.

**Cheating in the Weight of Coal.**

Some of our daily papers, we are glad to see, recommend an Inspector of Coal, as we did last week. The necessity of a censorship over the coal dealers is positively necessary. We see by some of our cotemporaries that in Boston a colored deacon was induced by the advertised low price of coal at a certain place to purchase it from the philanthropic dealer, but had hardly ceased congratulating himself on the purchase, when he discovered that his bin, which was made to hold just three tuns, the quantity that he had bought, was not full. The cautious deacon had the coal taken out and weighed, and then sent it back, dumped it down on the premises of the cheating dealer, and demanded full weight, with damages for his trouble and expense, and three tuns of coal gratis for hush money, all of which was paid, and the worthy deacon went on his way, rejoicing that out of the mammon of unrighteousness he had made his winter's fuel. But the story got out, and the papers contain cards from some of the dealers, declaring that they are not the men who sell coal under price and make it up by delivering it under weight.

**German Cure for Jaundice.**

The German cure for jaundice is said to be the sudden stir of the bile by an arousal of indignation. Willis, in one of his letters from Idlewild, mentions the case of his brother, who called in a physician when prostrated with the jaundice, in Leipsic, Germany.—"The doctor left, promising to send in his prescription. Meanwhile an old woman entered, who accused my brother of stealing, spat in his face and ran out of the room! This was the medicine—immediately effectual—for with the vigorous start of the bile commenced a rapid recovery."

**Breadstuffs.**

By the latest news from Europe, we learn that the harvest had been nearly finished under the most favorable weather, and that the crops were abundant. As a consequence, the price of breadstuffs had greatly declined, and flour was much cheaper in Liverpool than New York.

**Prizes for Newspapers.**

A premium of $20 for the best specimen number of an American newspaper, printed in the year 1854, having due regard to its typographical and artistical appearance, is to be awarded at the County Fair in Sumner County, Tenn., which is to be held at the town of Gallatin.

**LITERARY NOTICES.**

SURVEYOR'S MANUAL—This is a neat small volume for practical surveyors; it is published by J. W. Moore, Phila.; its author is E. W. Beans, of Norristown, Pa. The object of this work is to give directions in working the instruments, &c. It is a very useful and practical work.

BLACKWOOD'S MAGAZINE—This famous periodical for this month, issued by its enterising publishers, Messrs. Leonard Scott & Co., this city, contains eight excellent articles; the leading one is on the Holy Land, and discusses the controverted question respecting Sodom and Gomorrow..

THE CALCULATOR'S CONSTANT COMPANION.—This is a compact little volume, published by J. W. Moore, of Philadelphia: its author is Oliver Byrne, C. E., and professional mathematician. It is intended as a constant companion of practical men—machinists, engineers, &c. It comprises a table of 100,000 calculations, and is a labor-saving calculating volume.

ALMANACS—We are indebted to Messrs. Fowlers & Wells, No. 308 Broadway, for copies of the Phrenological and Water Cure Almanacs for 1855. They are illustrated with a number of engravings and contain a great deal of very interesting matters.

THE NATIONAL MAGAZINE—Abel Stevens, Editor. The October number of this excellent magazine is finely illustrated, and contains some very interesting articles. It is in every respect a high toned elegant monthly. Terms $2 per annum. Carlton & Phillips, publishers, N. Y.

## Inventors, and Manufacturers

The Tenth Volume of the SCIENTIFIC AMERICAN commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

Its general contents embrace notices of the LATEST AND BEST SCIENTIFIC, MECHANICAL, CHEMICAL, AND AGRICULTURAL DISCOVERIES, —with Editorial comments explaining their application notices of NEW PROCESSES in all branches of Manufactures; PRACTICAL HINTS on Machinery; information as to STEAM, and all processes to which it is applicable; also Mining, Millwrighting, Dyeing, and all arts involving CHEMICAL SCIENCE; Engineering, Architecture; comprehensive SCIENTIFIC MEMORANDA: Proceedings of Scientific Bodies; Accounts of Exhibitions,—together with news and information upon THOUSANDS OF OTHER SUBJECTS.

Reports of U. S. PATENTS granted are also published every week, including OFFICIAL COPIES of all the PATENT CLAIMS; these Claims are published in the Scientific American IN ADVANCE OF ALL OTHER PAPERS.

The CONTRIBUTORS to the Scientific American are among the MOST EMINENT scientific and practical men of the times. The Editorial Department is universally acknowledged to be conducted with GREAT ABILITY, and to be distinguished, not only for the excellence and truthfulness of its discussions, but for the fearlessness with which error is combated and false theories are exploded.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and PEOPLE IN EVERY PROFESSION IN LIFE, will find the SCIENTIFIC AMERICAN to be of great value in their respective callings. Its counsels and suggestions will save them HUNDREDS OF DOLLARS annually, besides affording them a continual source of knowledge, the experience of which is beyond pecuniary estimate.

The SCIENTIFIC AMERICAN is published once a week; every number contains eight large quarto pages, forming annually a complete and splendid volume, illustrated with SEVERAL HUNDRED ORIGINAL ENGRAVINGS.

**TERMS! TERMS!! TERMS!!!**

| | |
|---|---|
| One Copy, for One Year | $2 |
| " Six Months | $1 |
| Five copies, for Six Months | $4 |
| Ten Copies for Six Months, | $8 |
| Ten Copies, for Twelve Months | $15 |
| Fifteen Copies for Twelve Months | $22 |
| Twenty Copies for Twelve Months | $28 |

Southern, Western, and Canada Money taken at par for Subscriptions, or Post Office Stamps taken at their par value. Letters should be directed (post-paid) to

MUNN & CO.
128 Fulton street, New York.

☞ For LIST OF PRIZES see Editorial page.


© 1854 SCIENTIFIC AMERICAN, INC.